THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—26TH YEAR. SYDNEY, SATURDAY, MAY 20, 1939. No. 20.

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STERILITY.[1]

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IN these days of a falling birth rate the question of sterility is one of national importance, and one frequently finds reference to this subject in the lay Press. Let me draw your attention to a recent newspaper article by P. J. Lynch, a former president of the Senate. The figures he quotes were obtained during actuarial investigation for the Australian insurance scheme. The figures, which are as follows, give great food for thought:

1. In 1881 the natural increase was 35 per 1,000. In 1921 the natural increase was 25 per 1,000. In 1936 the natural increase was 17 per 1,000.

2. There are 420,000 Australian homes or married couples without children, and 268,000 with one child.

3. Had the natural increase of 1881 been maintained, the population of Australia would now be 11,000,000 instead of 6,500,000.

These figures may prove many things; but it seems beyond doubt that at least to some extent "natural" sterility is responsible for the alarming fall.

I recently attended a meeting of the obstetrical and gynæcological section of the Royal Society of Medicine, at which medical aspects of the fall in the birth rate were discussed. To keep the discussion relevant to the problem was beyond the powers of the president of the section; but the various views expressed, if not all illuminating, were at least amusing. One Harley Street gynæcologist stated that the fall in the birth rate was due to improved contraceptive knowledge and to lack of desire for reproduction. He had the temerity to challenge any medical man in the audience to stand up who had as many children as he could have had. The offer was not accepted. It is not my intention to issue the same challenge, for I see that you are

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on August 17, 1938.

now all comfortably settled. However, to dismiss the personal element, I am certain that we are all agreed that the problem of the sterile couple is one which occasions us considerable worry, and to help such a pair to achieve their desire is something well worth our efforts.

It will be noticed that in the preceding paragraph reference was made to the sterile couple; and I must mention here that figures varying from 17% to 59% are quoted by well-known authorities as the percentage of instances in which the male is at fault in sterile matings. In any investigation of sterility this aspect of the problem must be borne well in mind.

The definition of sterility varies. Matthews Duncan considers that failure to conceive on the part of a young married couple during a period of four years is indicative of sterility. However, this must be an elastic definition, because failure to conceive on the part of partners of greater age in a shorter period would warrant investigation.

Sterility is further divided into two large groups, primary sterility and secondary sterility. Such a distinction is of importance when it is realized that consultations regarding sterility are perhaps as frequent for failure to conceive after one or more pregnancies as for primary sterility. These groups overlap one another considerably in their ætiology; but once conception has occurred some causative factors can be excluded. In this connexion the work of Bublitschenko[1] is of interest. He investigated sterility following abortion, and whilst inflammations were of first importance, he found that constitutional defects came next. He also made the significant observation that in the latter group it was not unusual to obtain a history indicating that ovarian hypoplasia antedated the abortion.

History Taking.

The importance of the history in the investigation of a sterile woman cannot be over-stressed. The family history may suggest an hereditary predisposition to constitutional disease or to endocrinal dysfunction. The past history may immediately indicate an ætiological factor.

In this regard special inquiry should be made respecting the general health, especially at about the period of adolescence, as some information suggesting gonadal deficiency might be obtained. Acute illnesses, such as scarlet fever or tonsillitis, may affect the tubes and ovaries. The occurrence of mumps, especially if complicated by oophoritis or orchitis, is worthy of note. Interrogation regarding venereal disease or symptoms indicative of such infection is of particular diagnostic import. Similarly, previous operations (for example, appendicectomy in the woman or double herniotomy in the man) may provide some guide to ætiology. Occupational factors may be influencing sexual activity. Progressive or sudden increase in weight would direct attention to possible endocrine disorder.

The family history will bear inquiry. The health of the parents, the well-being of the mother during her pregnancy with the patient, and whether the child was carried to term, all are important. The number of full-time pregnancies of the mother and any miscarriages and the family attainments of the patient's near relatives may provide a clue to some hereditary predisposition to endocrine or constitutional dysfunction. The age of the parents at the time of the patient's birth, together with domestic circumstances during the patient's childhood, should be noted.

Inquiry as to the patient's marital life will perhaps give some clue to the ætiology. Completeness of the sexual act, the reaction of the woman to intercourse, the frequency of intercourse, any history of contraceptive practices or dyspareunia should be noted. Gibbons[2] states that the female orgasm affects sterility; but the occurrence of pregnancy following rape throws some doubt on this assumption.

Some contraceptive practices may result in sterility. Green Armytage condemns the "pro-race pessary" because of damaging effects on the cervix; but this opinion is not generally held. If the parties have been married before, and if previous marriages have resulted in conception, an immediate guide to ætiology is obtained. It would still be possible, however, that one was dealing with a case of selective fertility. If it is a case of secondary sterility with the same husband, the fault is much more likely with the female partner, although some intercurrent development may have affected the husband's fertility.

A detailed menstrual history is the next step in investigation. Delayed menarche, menarche followed by a long period of amenorrhœa, oligomenorrhœa or hypomenorrhœa at once suggests dysfunction of the pituitary ovarian mechanism. The development of dysmenorrhœa, menorrhagia or intermenstrual discharge, whilst sometimes indicating endocrinal upsets, is more likely to be due to inflammation. Interrogation regarding any missed menstrual period or delayed menstrual period followed by rather excessive hæmorrhage may indicate an unrecognized early abortion, the sequelæ of which may explain the sterility.

When the histories have been taken investigation is necessary. Meaker[3] has pointed out that thorough examination of the partners to a sterile union will in the majority of cases reveal several ætiological factors. In his series the percentage was 4·2. The remedying of some factors will perhaps enable Nature to overcome the rest. It is therefore necessary to investigate all patients thoroughly, except when some absolute bar to conception exists, irrespective of the obvious presence of some condition which may be considered the explanation of the sterility.

Investigation.

A suitable basis for investigation is that set out by Polak.[4] He enumerates the following as basic requirements for conception: (i) a motile spermatozoon deposited in the right place; (ii) a

matured ovum; (iii) a patent tubo-uterine tract; (iv) normal *corpus luteum* with normal progressive changes in the ovum; (v) normal secretions, male and female, with compatible reactions.

The numerical order of these requirements, while not perhaps demonstrating relative importance, definitely indicates the necessity for proving that the male partner to the sterile union can be exonerated before the female is submitted to more thorough investigation than that of the ordinary routine and pelvic examination.

I shall discuss now, in order, the basic requirements for conception as suggested by Polak.

Spermatological Investigation.

That a motile spermatozoon must be deposited in the right place scarcely covers the complete role of the spermatozoa. Of all the investigators of this aspect of sterility, Moensch[5] must be given pride of place; it is largely due to his writings that greater consideration is now given to the male partner in a sterile union. Failure of the male partner has been variously estimated to occur in from 17% to 59% of instances. Most authorities choose a middle course and put the figures at about 30%.

The work of Moensch was evolved from comparative biology, as Williams and Savage, veterinary surgeons, had demonstrated that the fecundity of a bull depended on the normality of its spermatozoa. By careful study and special staining Moensch was able to demonstrate numerous types of spermatozoa, differing in head formation. Although acknowledging the importance of motility, he considers sperm-head morphology to be the best index of man's fertility. Should one subscribe to Moensch's ideas, and there seems every reason to do so, this study in itself becomes more or less a specialty.

Kleegman[6] has confirmed the observation of Moensch in this respect, and sets out normal figures for assessment of spermatological function. These are as follows: (i) the ejaculant should be 3·0 to 4·5 cubic centimetres, and turbid; (ii) 60% of the spermatozoa should be motile and should retain motility for five hours; (iii) there should be less than 20% of abnormal sperm heads; (iv) the minimum number of 60,000,000 per cubic centimetre should be present.

The foregoing indicates quite clearly that mere deposition of a motile spermatozoon is in itself no proof of fertility. Deposition in the right place necessitates normal male genitalia; but apart from such obvious requirements the male partner should have a thorough general and genito-urinary examination should spermatological investigation reveal gross departure from normality.

Whilst agreeing that the detailed examination of spermatozoa as carried out in some American clinics is the ideal, one must of necessity modify this investigation. For practical purposes two simple tests should suffice to prove male fertility. These are the condom test and the Hühner test. The first test is made with the ejaculant obtained by the use of an ordinary male sheath at intercourse. It is preferable to transfer the semen to a small glass bottle as soon as possible owing to risk of damage to spermatozoa by the rubber. The specimen should be examined at the earliest opportunity and note taken of quantity and quality. Smears are then examined with the microscope for motility and morphology of the specimen, and some estimate is made in comparison with the accepted standard. The Hühner test depends on the recovery of motile spermatozoa from "the seminal pool" in the posterior fornix and from the cervical canal within, if possible, one hour of intercourse.

Ovarian Investigation.

The second requirement, a mature ovum, is again an obvious one; but it is only in recent years that gynæcological advances have enabled satisfactory determination of maturity to be carried out. Such advances were dependent on the recognition of the ovarian cycle with corresponding endometrial changes demonstrated by biopsies. Ovarian activity is dependent on anterior pituitary control, the corollary to which is that ovarian dysfunction may be primary or secondary to pituitary dyscrasia. Where the degree of failure is pronounced, whether it be primary or secondary, hypoplasia of the genitalia and poorly developed secondary sex characteristics will be noted.

The importance of distinguishing between primary and secondary ovarian failure has been stressed by American writers; but unfortunately, as yet, there are very limited facilities for the carrying out of the necessary tests which have been suggested by Charles Mazer[7] and Brooke Bland *et alii*.[8] As treatment varies with each class it would be very helpful to obtain this information from all patients suffering from sterility. With primary ovarian failure there is a demonstrable amount of serum prolan—an effort by the anterior pituitary to stimulate ovarian activity; when the pituitary is at fault the serum prolan is absent or in minute quantities. It would therefore be futile to stimulate an already over-acting pituitary in the former case, whilst stimulative treatment would be helpful in the latter. It has been suggested by Brooke Bland and by R. Chute[9] that harm may result from failure to differentiate the two classes of patient. The authors mentioned in this section state that the hirsute and masculine type of patient is not infrequently subpituitary in make-up, whilst the patient with primary ovarian failure may exhibit an excess of femininity. Eunuchoidism is sometimes demonstrated in the woman with primary ovarian failure, and in such cases a skiagram of the bones revealing late epiphyseal fusion would be diagnostic.

It should be pointed out that some cases of sterility are due to failure of the internal secretions of both the pituitary and the ovary.

Whilst the pituitary ovarian mechanism is of paramount importance in the maturation of ova, it is undoubtedly influenced by the other ductless glands. There may be evidence particularly of hypo-

thyreoidism or hyperthyreoidism, and in such cases an investigation of the basal metabolic rate would be helpful.

Investigation of the Patency of the Tubo-Uterine Tract.

Tubal occlusion was once considered the cause in most cases of sterility; but investigation shows this to be fallacious. The embryological growth of the reproductive tract is such that many anomalies, varying from an imperforate hymen to complete lack of canalization, are possible by arrest of development. Hymenal or vaginal obstruction should be immediately recognized, and requires no further discussion. Anomalies of development due to lack of fusion of that portion of the Müllerian ducts which forms the uterus, or incomplete obliteration of the septum, will not cause absolute sterility, but will lessen the chances of conception. Hypoplasia of the vagina or uterus is bound up with ovarian dysfunction.

The most common causative factor under this heading is tubal occlusion. Green-Armytage[10] estimates this condition as being responsible for 14% of cases of primary sterility. Holland[11] states that in only 4% of these cases are blocked tubes found. Other authorities quote comparable figures, although recently M. Rodecourt,[12] quoting Schultze's figures, stated that in 40% to 50% of 1,000 cases of sterility tubal occlusion was present. It is undoubtedly important to investigate tubal patency when gross anomalies have been excluded. The tests available are Rubin's insufflation and lipiodol injection. Some authorities favour the latter method, stating that human error is largely eliminated, that greater information is obtained and that the therapeutic cure rate, placed at 20% by Green-Armytage,[13] is higher. Advocates of the former test, for example G. King,[14] maintain that it is possible to obtain sufficient information and that the dangers attendant on lipiodol injection are avoided. Meaker[15] considered that entrance of lipiodol into uterine veins is not uncommon, but is fortunately without real danger. Tubal inflammation with giant-cell formation, pelvic peritonitis and sudden death have been recorded. I am of the opinion that the simple insufflation test should be used primarily; if occlusion is found, lipiodol injection should follow to demonstrate the site of obstruction. Tests for tubal patency should always be carried out in the early post-menstrual phase of the cycle. At other times blockage of the small uterine ostium by the thickened secretory endometrium may lead to a fallacious result. The occurrence of spasm in the tube may similarly cloud the issue. Repetition of all tests indicating occlusion is really advisable. At the Chelsea Women's Hospital, London, I have seen curettage of the cornua carried out when the primary insufflation test indicated obstruction of the tubes, and the test was immediately repeated. Such removal of obstructing endometrium may result in the passage of gas through the tubes, but the risk of air embolism makes one prefer repetition of the test early in the cycle.

Other conditions obstructing the tubo-uterine tract may be the result of nervous, inflammatory or neoplastic conditions. Vaginismus, whether primary or dependent on some inflammatory lesion causing dyspareunia, may prevent penetration. Inflammatory or neoplastic conditions may result in atresia or obstruction of the vagina, cervix or uterus. Post-operative conditions may have a similar result in the vagina or cervix, or the atresia may be congenital. Without actual obstruction, tumours may form a mechanical hindrance to coitus. Even in the absence of obstruction, tumours by their presence may be ætiological factors in sterility. In this regard it is interesting to note that Jeffcoate[16] considers that the clue to sterility in these cases is in the associated ovarian disorder. Careful vaginal and bimanual examination will exclude most of the conditions mentioned.

Abnormalities of uterine flexure and anomalies of cervical development are more often the index of ovarian hypoplasia, and of themselves will not cause absolute sterility. It is possible that retroflexion occasionally causes kinking of the tubes. Correction of a retroflexed uterus will not infrequently cure sterility, other important ætiological factors being absent; but why this is so is difficult to explain. Particularly is this the case with a presumably congenital retroflexion. The use of a stem in the cochleate uterus or conical cervix possibly acts by stimulating the ovaries, as indicated in animal experimentation by Loeb.[17]

Investigation of the Menstrual Cycle.

For conception to occur the ovary must pass through the normal cycle leading up to *corpus luteum* formation with production of adequate quantities of œstrin and progestin. On the cycle depends endometrial preparation for the nidation of the ovum; without it implantation cannot occur, or with diminished preparation due to *corpus luteum* deficiency the ovum will be implanted only to be subsequently cast off.

Hartman demonstrated the occurrence of anovular menstruation in monkeys and suggested its occurrence in women. Endometrial biopsies enable us to determine this phenomenon, which is now considered a not altogether infrequent explanation of sterility. Many writers, including Novak[18] and Green-Armytage, stress the importance of this condition. Amytage considers it a likely cause of early sterility in the young married girl in India. That anovular menstruation does occur is undoubted, and the necessity of making a premenstrual biopsy and obtaining a normal report before submitting a woman to laparotomy for some other possible causative factor is self-evident. The importance of this condition will be realized when it is mentioned that Novak[19] investigated 50 regularly menstruating women and found a normal progestational endometrium in no more than 23.

It seems likely that vitamin deficiency has some influence on this condition. Evans and Bishop have demonstrated that vitamin *E* deficiency in rats

causes sterility and abortion. Vogt-Moller[20] claims to have cured cases of sterility by vitamin *E* therapy. There is some evidence to be adduced from the experiments of Evans and Bishop,[21] and also of Rowland and Singer,[22] that vitamin *E* acts through the anterior pituitary and so influences the ovarian cycle. Macomber[23] cured a number of sterile patients by dietetic changes alone; and although no endometrial biopsies were taken, it seems not unlikely that dietetic alterations were of value by changing an anovular menstruation into a normal menstrual cycle. Although this conclusion may be unjustified, there can be little doubt that diet, and especially vitamins, influence ovulogenesis.

Investigation of the Male and Female Secretions.

In discussing the last basic requirement, normal secretions in male and female, we are on contentious ground. Whilst some authorities, including Green-Armytage, stress the importance of vaginal acidity, Moensch,[24] who quotes Grafenberg to support him, states that vaginal acidity has nothing to do with sterility. He maintains that spermatozoa can live for a considerable time in 0·5% lactic acid solution and that vaginal secretions never reach an equivalent degree of acidity. He agrees that prolonged contact with highly acid secretions will kill spermatozoa, but contends that spermatozoa normal in morphology and motility will leave the vaginal canal before being damaged. This raises the question of cervicitis and sterility. As the cervical secretion remains alkaline despite cervicitis, this condition certainly does not act by increasing acidity. Should it be the cause of sterility, it is on account of the viscosity and leucocytic infiltration of the operculum preventing passage of the sperm. Moensch, however, considers that a healthy spermatozoon will traverse such an operculum. None the less, cervicitis should be remedied, as it may be one of the factors involved. Vaginal acidity, normally 4·0% to 4·6%, may be determined by means of a small colorimetric apparatus.

Immunity to spermatozoa and selective fertility have been considered the cause of sterility in some instances, but their importance is doubtful. Such cases may sometimes be explained by varied libido. For example, a man who has had children by one woman of poor sex libido may be infertile when later married to a woman of high sex libido, because of loss of normality of the spermatozoa resulting from frequent intercourse.

It is possible that Kurzrok's[25] observations on the reaction of the uterus to semen may explain some such cases. The normal reaction is one of relaxation of uterine musculature, but in occasional cases spasm occurs. He mentions cases in which one specimen of semen caused relaxation, another spasm, in the same uterus.

Treatment of Sterility.

In evolving a scheme for the investigation of the sterile couple and the basic requirements for conception, one has provided a foundation on which treatment can be based. Haphazard treatment of these patients would mean that cure would result only by lucky chance. In any discussion of therapy it is necessary to make mention of that group of cases labelled "relative sterility", which as yet has not been mentioned. This group consists of those women who, although able to conceive, are apparently unable to carry pregnancy through to successful termination.

The Male Partner.

I shall deal primarily with the male. As has already been indicated, the gynæcologist would not be responsible for the more thorough investigation and treatment of the male partner should such prove necessary. Ordinary routine examination, together with the semen tests suggested, should, however, be within our province. The semen examination may reveal normality, azospermia, oligospermia, necrospermia or spermatozoa without normal motility. The history and examination may have revealed some constitutional defect in explanation of these findings; but in the event of gross departure from normality the male partner should be handed over to the genito-urinary specialist for thorough examination. Should the morphology or motility of the spermatozoa suggest only a minor departure from the normal, advice as to hygiene, marital relationship and diet may be given. This advice should be primarily an attempt to improve the male physically by exercise, regularity of habits, diminution of alcohol and nicotine, and suitable diet. In regard to diet there is little to suggest except that biological investigations emphasize the importance of vitamins. It may be considered advisable in some cases to separate husband and wife for a short period. Successful cases have been recorded in which the only therapy was to send the busy office man away to the country for a holiday.

Endocrine therapy for the male can be rationally used only when thorough examination has excluded all constitutional and local diseases. A male partner exhibiting hypothyreoidism, perhaps only revealed by a low basal metabolic rate, should be given thyreoid extract, and such treatment has met with success. Hormones of the male reproductive organs, whilst available, are as yet unreliable in activity; but strangely enough the prolan preparations seem to have beneficial effects on the male. It seems likely that this therapy would be helpful in some cases of male sterility.

The Female Partner.

"Relative Sterility."—Before dealing with true sterility in the female, let us first consider "relative sterility". This problem is one of obstetrics rather than of gynæcology. It may be remembered that the taking of a detailed menstrual history was stressed and the fact that the gynæcologist may learn of a delayed menstrual period followed by rather profuse loss. Such irregularity, repeated, would suggest the occurrence of early abortion. It seems more than likely that without pronounced irregularity of the menses the early fertilized ovum

is sometimes cast off. Only by microscopic investigations of the decidua and the finding of chorionic elements could such cases be definitely diagnosed.

It has been suggested that some of these cases depend on "relative sterility" in the male; but there seems little doubt that the fault is with the female partner in most cases. The treatment in such cases, which has been influenced by the modern conception that repeated abortion, in the absence of constitutional or local disease, depends on deficiency of *corpus luteum* hormone, is by the use of progesterone, prolan or perhaps vitamin *E*.

True Sterility.—For discussion purposes we may designate "true sterility" as absolute, in distinction from "relative sterility", and then divide sterility into primary and secondary. That absolute sterility may be taken to indicate definite inability to conceive may constitute an objection to such a division; but for practical purposes it will suffice.

It is not my intention to deal with the treatment of all pelvic conditions which may be causes of sterility, for to do so would necessitate covering a wide phase of surgical gynæcology. It is self-evident that when the examination of a woman reveals some gross anomaly of development or some grossly pathological condition, this must, if possible, be dealt with by appropriate measures before any hope of success can be entertained.

I have already mentioned the advisability of dealing with an unhealthy cervix because of its possible influence. It has also been noted that correction of displacement of the uterus may be all that is necessary. A word of warning that such displacements may be only the accompaniment of other abnormalities must be repeated. Jeffcoate's statement that tumours and ovarian dysfunction go not infrequently hand in hand must be remembered.

Constitutional diseases are of greater importance on the male than the female side of a sterile union, but, if present, should receive adequate attention.

Endocrine Therapy.—Those women evidencing endocrinal dysfunction will occasion us the more trouble because our present knowledge is incomplete and our active therapeutic armamentarium small. The lack of facilities for the thorough biochemical examination of the sterile woman further handicaps us in evolving rational endocrine therapy.

As already indicated, there are some clinical guides to localization of endocrine dysfunction. By these signs, together with endometrial biopsies, we may be assisted in our decision regarding ovarian or pituitary failure. In the former case therapy with œstrin should be beneficial; but it must be remembered that it has been shown that large doses of œstrin may damage a normal pituitary by depressing its function—the intimate and correlated activity of the ovary and pituitary must never be forgotten. Should clinical evidence suggest pituitary dysfunction our difficulties are enhanced, because available prolan preparations, whilst active in obstetrical therapy, are of rather doubtful benefit in gynæcological disorders. However, the recently produced pregnancy serum prolans are apparently going to be more useful. The essential difference between urinary and serum prolans is as yet not clearly defined; it may be a question of purity. "Physex Leo", produced from the urine of pregnant women, seems much more useful than other urinary prolans.

The sterile woman suffering from hypoplasia of the reproductive organs associated with regular though scanty menstruation would be perhaps best treated with œstrin. Such treatment could be given by small dosage throughout the cycle, for example 1,000 units three times a week, or preferably by larger dosage in the first ten days of each cycle, for example 20,000 units on the second, fourth, sixth and eighth days.

Should the patient exhibit evidence of subpituitary stigmata, together with menstrual irregularity or anovular menstruation, therapy with prolans may be of value. In the latter condition a combination of œstrin and progesterone treatment given in correct relationship to the menstrual cycle would also be helpful.

Kurzrok, of New York, has shown by hormone estimation that there are patients in whom, despite normal hormonal biochemistry, there is hypoplasia of the genital tract. This hypoplasia may be extreme, resulting in gross under-development of the lower portion of the Müllerian ducts with a tiny uterus and vagina. However, there are cases of much milder type, and in these we can be of help. Without serum investigation such cases would be difficult to class; but in the presence of hypoplasia with a normal menstrual cycle and endometrial changes hypoplasia *per se* could be considered as a factor in the sterility. Such patients should be benefited by œstrin therapy. One noticeable feature in such women is the presence of well-developed secondary sex characteristics. The trouble is apparently an inherent defect of the Müllerian system or lowered response to œstrin stimulation, or both.

Hypothyreoidism has been noted as a possible factor in male sterility. For the female it is no less important. Clinical examination may reveal this evidence, or investigation of the basal metabolic rate may be thought advisable. In patients exhibiting subpituitary stigmata the addition of thyreoid extract to the treatment will undoubtedly be of help. In this regard it must be noted that there is close relationship between the pituitary, the ovary and the other ductless glands.

X Ray Therapy.—X ray therapy to ovaries and pituitary in sterility due to endocrine dysfunction has been used to some small extent in a few of the larger clinics. Difficulty in assessing correct dosages and grave risks of causing permanent damage to the irradiated glands have prevented general adoption of this therapy.

Dietetic and Vitamin Therapy.—The question of diet and sterility has already received mention, and in treatment it must be remembered. Whilst con-

ception may occur and pregnancy be successfully completed by women on the widest range of dietaries, there is substantial evidence that attention to diet will enhance the chances of conception for some women. The diet should necessarily be ample in its usual components, but especial attention should be given to the vitamin intake. An adequate allowance of fruit, vegetables, eggs and dairy produce will ensure sufficiency in vitamins *A*, *B*, *C* and *D*; but in the treatment of sterility vitamin *E* must not be overlooked. Greens are perhaps the only common article of diet which contain this vitamin in any quantity; but the addition of whole meal and foods prepared therefrom will greatly increase the amount of vitamin *E* ingested. The prescribing of wheat germ oil or cottonseed oil would ensure adequacy. In the British Drug Houses laboratories in London abortion in rats fed on a vitamin-free diet following conception can be prevented by addition to the dietary of vitamin *E* or by the institution of prolan or progesterone therapy. This suggests a close relationship, as yet unproved, between vitamins and hormones, and so emphasizes the importance of diet in this regard.

Surgical Treatment.—I have already intimated that I intend to omit what might be called the surgery of sterility. However, to omit some mention of operations for restoring the patency of occluded tubes would be to ignore recent advances in technique of these operations.

At the outset it must be understood that investigation has shown that the only bar to conception is occlusion of the tubes. Furthermore, in fairness to the patient the chances of success of the operation must be pointed out. The age of both parents and the general condition of the female must, of course, be considered.

It is well known that the chance of success depends on the site of obstruction. Should the occlusion be at the ampullary end of the tube, prospects are hopeful; proximity of the occlusion to the uterus diminishes chance of success. Opening of the ampullary end of the tube is not fraught with great difficulty. This has now sufficiently frequently resulted in subsequent pregnancy in a high enough percentage of cases to be well worth while. Successful treatment of tubes blocked at the uterine end is much less frequently reported. Improvement in operative technique and the development of an operation similar to that for implantation of ureters into the bowel have resulted in some successful cases. Bonney[26] has reported several cases of this nature, the tubes being implanted into the uterus over strands of silkworm gut passed through the tubes and pulled down through the cervix. A similar procedure with ureteric catheters passed in the same way has been described.

Such operative procedures should, of course, be preceded by utero-salpingograms, which indicate sites of obstruction. It is equally important to demonstrate patency at the conclusion of these operations by insufflation or injection from the abdominal ostium.

Tubal insufflation subsequent to operation should be carried out in an endeavour to maintain patency.

It should be pointed out here that Mintz[27] has recently published an article in which he claims a number of successes in reopening apparently occluded tubes by pelvic diathermy and repeated insufflation.

General Advice.

One will encounter numerous cases of sterility in which all investigations seem to indicate normality of both male and female partners. In such cases measures already described regarding hygiene, habits, frequency of intercourse and dietetics will naturally be given. Should vaginal acidity have been investigated and found to be high, alkaline douches may be prescribed. There is, however, one other factor which in such cases would warrant attention—an endeavour to determine the most fertile period of the female partner. The work of Ogino[28] and Knaus,[29] who were responsible for the development of the so-called "O.K. theory", appeared to solve the problem of ovulation and "the safe period". However, this theory, we lament, is not quite "O.K." after all. Kurzrok, in his book "The Endocrines in Obstetrics and Gynæcology", sums up the question of "the safe period" very capably, and this summing up applies equally to the most fertile period. He states that the period of fertility depends on three factors: (i) the duration of life of the spermatozoa in the female genital canal; (ii) the duration of life of the ovum after ovulation; (iii) the actual time of ovulation in the cycle.

He goes on to state:

> All these are variable and not as yet completely determined. It may be true that a woman has a safe period each month, but how are we to determine it with our present knowledge? If ovulation occurs on a given day this month, will it occur on the same next month or the one after? What are the limits of ovulation within the menstrual cycle in any woman observed over a long period of time? Are the spermatozoa of an individual always endowed with the same capacity to carry on in the female genital canal or are there variations in this capacity, thus limiting or increasing their viability? What activating effects have the secretions of the female genital canal upon spermatozoa? Is this activation a variable factor in the same and different individuals?

Kurzrok's ideas in regard to the problem of ovulation are substantiated by a recent article which describes investigations by Stein and Cohen.[30]

Such knowledge as we possess regarding ovulation can lead us only to suggest that a woman is most likely to conceive in those days of the cycle which fall between the termination of menstruation and the eighteenth day. It appears that at present the only cases in which one can definitely determine the date of ovulation are in the rare examples of *Mittelschmerz*. In this connexion the active life of a spermatozoon is of importance. The consensus of opinion seems to limit the duration of fertility of a spermatozoon to forty-eight hours. Some investigators state that active spermatozoa may be recovered from the reproductive canal two or three weeks after coitus. Moensch, I think, observed that

this was a reflection on the credulity of the investigator.

Although there will be cases in which our investigations reveal no abnormality, we need not entirely despair. The fact that insufflation or lipiodol injection has quite a high therapeutic cure rate in itself is in such cases cheering. The agreeable surprise associated with the return of an appreciable number of the patients investigated with the good news that conception has occurred will be ample reward.

Artificial Insemination.

One other method of treating sterility warrants brief mention; this is artificial insemination. For success it is advisable to inject healthy spermatozoa into the uterine cavity by means of a special syringe. Spermatozoa may be those of the male partner, or a carefully investigated donor may be used. In America and on the Continent a number of successful cases have been reported; elsewhere the method has met with little support.

In conclusion let me thank you for having given me the opportunity of speaking on this subject, which to me is of particular interest. It is surely an anachronism that in these days of scientific medicine, whilst we are all capable of giving more or less satisfactory advice as to contraception, we are definitely limited in our therapy for sterility. The scheme of approach to the elucidation of this problem, here set out together with a brief outline of more recent treatment, will, I trust, be of some help. Let me stress again the necessity of considering the sterile couple rather than the sterile woman, for only by such methods will therapy stand a chance of becoming rational.

I could not close my paper more fittingly than by repeating the words of the late J. C. Polak:

> There are many unsolved problems in this interesting subject, and, with all we have learned, most of our cures are by accident or incidental, for there are psychical and biochemical factors in the consummation of the marriage act which can and do prevent conception in the anatomically perfect.

Let not his statement engender despair, but rather let it encourage us to greater efforts in the elucidation of these "many unsolved problems".

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EXPERIENCES IN THE INVESTIGATION OF STERILITY.[1]

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THE purpose of this paper is to present a detailed account of fifty-seven patients who were subjected to the injection of lipiodol into the uterus for the diagnosis and treatment of sterility.

General Remarks.

It is to be remembered that a percentage of patients who complain of sterility will become pregnant after almost any procedure; for example, dilatation and curettage, operative cure of retroversion of the uterus, hormones given by the mouth and by injection, douching, the passage of time *et cetera*. There are also so many more or less nebulous aspects of sterility that a method which gives exact information as to the structure of the uterus and Fallopian tubes, in addition to having a therapeutic value, must command attention. The

[1] Read at a meeting of the Queensland Branch of the British Medical Association on March 31, 1939.

intrauterine injection of lipiodol does these things, and that was why I preferred to use this method.

It may be asked whether this method has advantages or disadvantages as compared with Rubin's test, that is, insufflation of air into the uterus or tubes. A recent article by King[1] gives most of the arguments in favour of air insufflation. He states that it is simpler and less fatiguing to the patient, that carbon dioxide is completely and harmlessly absorbed within a few hours, whereas lipiodol has been shown to remain for months and even years in the peritoneal cavity, and that lipiodol may produce a foreign body reaction in the tissues. He quotes Rabbiner as stating that the dangers are inflammation and even death. He also quotes Rubin, who cited a series of cases in which six patients developed mild peritoneal inflammation, and three of these required treatment for resulting pelvic abscesses. He recommends that its use be limited to those cases in which complete tubal obstruction is present and in which it is desired to localize the site of obstruction.

I have seen ill effects from lipiodol in one case only of this series; the patient developed a pelvic abscess, which, I think, resulted from instrumentation rather than from the effects of lipiodol. Several of the patients have had operations after the introduction of lipiodol, and no signs of peritoneal irritation were noticed, even though the lipiodol was still present in the pouch of Douglas.

Forsdike[2] says that lipiodol is completely absorbed from the peritoneum in seven to ten days. He also states that there is no peritoneal disturbance.

The complications I have encountered, in addition to the pelvic abscess already mentioned, are those common to dilatation of the cervical canal without anæsthesia—namely, pain in the lower part of the abdomen and a feeling of faintness. Pain was also complained of at times when the lipiodol reached the outer ends of the tubes. In a few cases difficulty was experienced in introducing the first dilator through the internal os.

It appears, then, that the risks associated with lipiodol are not greater than those associated with carbon dioxide. In addition, lipiodol is regarded as having a therapeutic value in the absence of tubal occlusion. Forsdike[2] has regarded it as necessary to use lipiodol therapeutically when insufflation has not been followed by pregnancy.

My reasons, then, for preferring lipiodol to insufflation are that by one procedure, and with very little disturbance to the patient, a therapeutic and a diagnostic effect are often gained at the same time.

Results.

King[1] quotes Rubin as having in 398 cases a percentage rate of 17·5 for pregnancy following insufflation. In his own series of 272 insufflations, 16 patients (6%) became pregnant in from one to seventeen months after the test. The percentage rate among those in whom tubal patency had been proved was 11·6.

Forsdike[2] gives a percentage rate of 14 pregnancies among 41 patients with patent tubes (34%). Recently *The British Medical Journal* has published an article and some correspondence in which the rate for pregnancy following instillation of lipiodol was 35·5% and that for pregnancy following insufflation was from 25% to 29·7%.

In my group of 57 cases pregnancy followed in 15. This gives a percentage rate of 26·3. In 42 cases one or more tubes were patent; fourteen of these patients became pregnant, the rate being 33·3%. One of my patients whose tubes were blocked became pregnant eleven months afterwards.

Male Sterility.

The male is to be held responsible in 25% of married couples according to Forsdike.[2] When a patient wishes her sterility investigated, the share her husband takes is pointed out to her and an examination of the husband is asked for first. In most cases the husband's semen was examined from a condom specimen; but latterly I have been using Hühner's test, in which the secretions from the cervical canal and vagina are examined for spermatozoa as soon as possible after coitus. If aspermia or necrospermia is found the patient is advised against further investigation. If the sterility is secondary or acquired, then the husband is considered fertile. Some of the patients insisted on the investigation even when their husbands refused investigation, and one patient insisted even though her husband had aspermia.

Details of the Present Series of Cases.

The average age of the patients was 29·3 years. The oldest was forty-one, and there were two patients of this age. The youngest patient was aged twenty-one years, and there were two others of this age.

Duration of Sterility.

The average duration of the sterility was almost four years. The longest period was fifteen years and the shortest was three months.

The latter patient before her marriage had suffered from gonorrhœa and syphilis and had had her left tube and ovary removed. The condition of the right tube at the time of operation had been recognized as chronic interstitial salpingitis. After marriage she had been eager for pregnancy, a thing which I hardly considered possible. I allowed her to persuade me into injecting lipiodol, rather to show that she could not become pregnant than in the hope of assisting her. The skiagram showed that both tubes were occluded at their uterine ends. However, the patient became pregnant eleven months later.

The question arises as to when a patient should be considered sterile. The following is my procedure. If the patient is young, if there is no evidence of pelvic disease, if she has never been pregnant before, and if there is no previous history of such a condition as acute appendicitis, then I persuade her to wait for two years. When there is a history which raises a suspicion of tubal damage, such as infection after miscarriage, gonorrhœa or

appendicitis, then I think a period of twelve months is long enough to wait. Older patients, to whom time is precious, I investigate earlier.

The Use of Contraceptives.

I have been under the impression that contraception is a cause of sterility. It has been a routine measure to question all patients in this series, but only three admitted the use of contraceptives. It would seem, then, that if contraceptives have any effect in this way, it must be merely a temporary one.

Primary or Secondary Sterility.

Primary sterility is regarded as being present when no previous pregnancy has occurred, and secondary sterility when a previous pregnancy has occurred.

Primary sterility occurred 35 times and secondary sterility 23 times.

Pregnancy followed in 10 out of the 35 cases of primary sterility (a rate of 28·6%), and in five out of the 22 cases of secondary sterility (a rate of 22·7%).

It would appear slightly easier to relieve the sterility of those patients who have not been pregnant before.

The Cause of the Sterility.

I have endeavoured to trace the reason for the sterility in each case. It has not been possible to assign a cause in 20 cases. Of the remainder, the estimated causes are as follows:

A previous miscarriage appeared a reasonable explanation in twelve cases.

Salpingitis was the cause in one case.

Ectopic gestations had been removed in two cases, one patient having had a double ectopic pregnancy.

Six patients gave a history of having had an attack of gonorrhœa, and one of these had had syphilis as well.

Malformation of the uterus was present in two cases, and this could have been the factor responsible.

In two cases the obstetrical history was at fault. One patient had had an attack of puerperal fever after a confinement and the other a confinement complicated by eclampsia.

Two patients had ovarian dermoid cysts. In one case they were bilateral.

One patient had palpable fibromyomata.

One patient was aged forty years, and her age might have been the factor.

One patient was considered to have a low degree of fertility.

Finally, an upset in the normal secretion of ovarian hormone might have been responsible in one case.

There are no very surprising conditions in this list, but some comments are called for. In a series of cases such as this there will always be a definite proportion for which no explanation can be found. The mischances of pregnancy, tumour formation and advancing years would always play a part.

It is of interest that six patients gave a history of more or less recent appendicitis. This acts, of course, by promoting a secondary salpingitis, which in turn leads to closure of the tubal lumen.

The patient referred to as having a low degree of fertility told me that her mother had had two children only, and these only after some effort. She herself had one child thirteen years earlier, and three years later she had an operation on the cervix for sterility. This was followed four years later by insufflation of air, and a pregnancy resulted, only to end in miscarriage. After her second marriage I introduced lipiodol into the uterus three years ago, to find the tubes patent; but no pregnancy has yet occurred.

The patient regarded as having a hormonal disturbance was referred to me with the diagnosis of infantile uterus. I have not been able to recognize an infantile uterus in any of the other patients, and I do not regard the condition as a factor in the causation of sterility unless it is accompanied by disturbances of menstruation, such as increased or diminished loss or irregularity of the interval.

The patient under discussion complained of small loss when menstruating and of bad headaches, but she had no dysmenorrhœa. In view of this she was given a reasonable amount of follicular hormone and later thyreoid extract. Neither had any effect on the menstrual loss nor on her general condition. She was then submitted to the intrauterine introduction of lipiodol and became pregnant four weeks later.

You will notice that retroversion of the uterus has not been mentioned as a cause of sterility. Uncomplicated retroversion is not considered to be a cause, and a patient who has this condition is investigated in the usual manner.

Previous Therapeutic Procedures for Sterility.

Most of the patients had not had any previous treatment for sterility. Dilatation and curettage had been performed in three cases with no result. Five patients had had a suspension operation for retroversion with no result. One patient had been subjected to air insufflation, and one patient had had an operation on her cervix with no result.

I have never been able to see the advantages of dilatation and curettage for this condition. There could be two effects: the size of the cervical canal is enlarged and perhaps a little air is forced up through the uterus and tubes ahead of the dilators. It does not appear rational to me that a spermatazoon could find access through a dilated cervix any more easily than before its dilatation. If the effect of the dilatation and curettage is the second one, then lipiodol is better, because it gives exact information and has more therapeutic value. Also I have not been able to see that the position of the patient has been improved after an operation performed for the purpose of enlarging the external os.

Time Elapsing between the Injection of Lipiodol and Pregnancy.

The interval between the introduction of lipiodol into the uterus and the pregnancy varied from three weeks to eleven months.

Two patients became pregnant in three weeks.
Two patients became pregnant in four weeks.
One patient became pregnant in five weeks.
Two patients became pregnant in six weeks.
Two patients became pregnant in seven weeks.
One patient became pregnant in ten weeks.
One patient became pregnant in thirteen weeks.
One patient became pregnant in eight months.
Three patients became pregnant in eleven months.

Thirteen patients were submitted to operation and two became pregnant as a result. In one case the tubes were thought to be obstructed at the ampulla, but at operation both were found to be patent. However, bilateral salpingostomy was performed and pregnancy followed in thirteen weeks. In the other case the introduction of lipiodol revealed no abnormality except for filling defects in the outline of the uterus. No pregnancy resulted from the introduction of lipiodol, so about eighteen months later dilatation and curettage were performed. This was followed by pregnancy.

Contraindications to the Use of Lipiodol.

The following disorders contraindicate the use of lipiodol: bleeding from the uterus, acute and subacute pelvic inflammation as evidenced by pelvic pain and tenderness on bimanual examination, gonorrhœa and the presence of conditions which would be aggravated by the pregnancy, such as heart disease, tuberculosis, chronic nephritis *et cetera*.

Misadventures of the Pregnancy.

So far as I can ascertain, all of the pregnant patients, with the exception of three, had normal confinements or are still progressing normally in their pregnancies. I give you the three abnormal histories in detail:

J.M., who had suffered from syphilis and gonorrhœa, became pregnant eleven months after the introduction of lipiodol had revealed obstruction of both tubes at their uterine ends. The patient miscarried at sixteen weeks. The next pregnancy, which occurred about five months later, went to term and resulted in a breech delivery of a stillborn infant. Four months later the patient was pregnant again, but she left the out-patient department and I have not heard what happened to this pregnancy.

V.R. had been married six and a half years and had never been pregnant. The introduction of lipiodol revealed that the left tube was completely blocked, but the right tube was patent. Pregnancy followed in five weeks and went to term. The delivery was natural and the child was born alive. The patient developed puerperal septicæmia on the fourth day and died on the tenth day after delivery.

A.B. had been married seven and a half years and had never been pregnant. She had been operated on six years before and the following procedures had been carried out: enlargement of the external os, removal of a cyst on the ovary, appendicectomy and caecopexy. X ray examination revealed some lipiodol in the pelvis the day after its injection. Pregnancy occurred seven weeks later. When about nineteen weeks pregnant the patient was admitted to hospital with an incomplete miscarriage, requiring curettage. She died shortly after the procedure from asphyxia, caused by a piece of meat in the larynx.

It is obvious that patients who become pregnant after the use of lipiodol run the same risks as those who become so with less effort.

Interpretation of the X Ray Pictures.

The interpretation of the X ray films is the most important and most difficult part of the procedure. I am still in doubt at times as to what some findings portray. Misinterpretations have resulted in this series from leakage of lipiodol back into the vagina. It is important to keep up a continuous pressure in the column of lipiodol from one end to the other. Spasm of the Fallopian tube has not appeared as a difficulty. If it occurs at the uterine end, steady pressure of the fluid will soon overcome it. If it occurs at the outer end, it will have passed off next day, when the further X ray picture is taken.

The diagnosis of tubal obstruction at the ampullary end can be made with certainty only from the X ray findings in the picture taken on the day following the injection. The appearance is characteristic, and later you will see that such a tube presents a smooth rounded outline of some size.

Technique of Injection.

The injection of lipiodol was carried out in the following manner.

The patient was placed in the lithotomy position at the bottom of the X ray table, the legs being held by assistants. A Sim's speculum was passed and the cervix was exposed. The vagina and cervix were swabbed with 1 in 1,000 flavine solution. The anterior lip of the cervix was seized with Moynihan's tissue forceps and the cervical canal was dilated by Hegar's dilators, the first three sizes being used. The hollow sound, filled with lipiodol, was then inserted until the rubber cone was pressed firmly against the external os. The speculum was withdrawn and the patient was pushed along the table until she was in the correct position so that the screen could be adjusted over her pelvis. A ten cubic centimetre syringe filled with lipiodol was attached to the intrauterine sound. Traction was made in a downward direction with the tissue forceps and the intrauterine sound was pushed in an upward direction, so that a tight joint might be secured at the external os. The X ray screen was placed in position; the room was darkened and the current switched on. When the tip of the sound in the uterus could be seen on the screen, the injection was commenced and the flow of the lipiodol was watched as it filled first the uterus and then one or both tubes out as far as the ampullary end. At this stage a picture was taken. The instruments were gently withdrawn and the vagina was packed lightly with gauze to prevent discomfort to the patient from the escaping lipiodol.

Very little trouble has been experienced from lack of cooperation, as all these patients are so eager to be helped that they are prepared to submit readily to all the necessary manipulations, uncomfortable though some of them are.

Difficulty has at times been experienced in passing the first dilator through the internal os. When this happens the manipulations are stopped and a further attempt is made on another occasion. I think that there is a real risk of perforation of the uterus if force is used to overcome this difficulty.

It is important to make sure that the rubber cone fits tightly against the external os. Sometimes an abnormality in the shape of the cervix, for example the presence of a large laceration, interferes with this; but most often interference is due to lack of sufficient pressure on the intrauterine sound. If the toothed forceps that grasp the cervix are pulled in a downward direction the rubber cone can be pressed firmly against the external os, and this difficulty is avoided. If the cone does not fit tightly, the interpretation of the X ray pictures is likely to be wrong, because much of the lipiodol may escape into the vagina instead of distending the tubes to their full size. One patient had to suffer

three attempts for this reason before success was obtained.

A manometer was not used for the injection. I consider that the observation of what is happening under the screen and the sensations of the patient are a sufficient safeguard against exerting too forceful a pressure. The maximum force that can be used is that exerted by a thumb and two fingers on the piston of a ten cubic centimetre syringe. It has never been necessary to use much force. If obstruction due to spasm of the tube occurs, gentle continuous pressure will cause it to relax in a few seconds. If the tubes are seen to fill completely and the patient complains of pain in one or both iliac fossæ, the injection is stopped; but the tension is maintained until an X ray picture has been taken. When the tension is released the pain ceases. The X ray picture will show whether the obstruction is due to spasm or to closure, for in the former case lipiodol will be seen in the pelvis in the second picture taken the following day, while in the latter case lipiodol will still be present in the ampulla.

Every patient complained of hypogastric discomfort during the dilatation of the cervix and a few felt faint. Some had discomfort when the uterus filled, and some complained of pain in the iliac fossæ when the tube was full. It was not necessary to admit any of the patients to hospital after the procedure, and all were able to go home in about half an hour's time. With one exception no late effects were noticed. Most of the patients had no complaint the day after injection, but one or two complained of a little discomfort in the lower part of the abdomen for about twenty-four hours.

Discussion.

When the investigation is completed the question of further treatment arises. When the X ray picture reveals patency of one or both tubes the patient is instructed to report if she becomes pregnant. If pregnancy does not occur, she is advised to report every three months. The opinion has been expressed that if pregnancy does not occur within nine months then the abdomen should be opened for investigation of any condition that might be present to prevent the ovum from reaching the *ostium abdominale*. I have not felt justified in recommending this measure unless a mass is palpable in the pelvis. If pregnancy does not occur and there is no evidence of pelvic disease, the patient is advised that pregnancy is unlikely to occur and that nothing further can be done.

If the X ray picture shows tubal obstruction, then advice is given according to the site of obstruction. I have been guided by the opinion that occlusion at the *ostium abdominale* gives a reasonable prospect of pregnancy if operation is performed, while occlusion at the interstitial portion of the tube holds out a very slight chance of success. Patients are therefore advised to submit themselves to operation in the former case, while in the latter, after explanation of the chances of pregnancy, they are left to decide for themselves.

The operation that has been performed on some of the patients in this series is salpingostomy. The closed ampulla of the tube is incised for most of its length and the mucous membrane is stitched to the peritoneal coat, patency thus being ensured. It is advisable after such an operation to test the tubes for patency shortly afterwards. I have been able to do this only once, as the other patients were quite satisfied with what had been done.

Operation was undertaken in one case when the obstruction was at the interstitial portion of the tube. A modified d'Este's operation was performed. The whole of the obstructed portion of the tube was removed, including the portion in the uterine cornu. The proximal free end of the remaining portion was split and each split portion was sutured into the uterine cornu in such a way that it occupied the position formerly held by the interstitial portion. Unfortunately the transplanted portion did not remain patent.

I shall now give in detail the history of the only patient who suffered ill effects as a result of the injection of lipiodol.

T.J.J., aged thirty-two years, was first seen in November, 1936. She had been married four years and had never been pregnant. Contraception had never been practised and she suffered from dyspareunia at times. She had been operated on for peritonitis seven years before and the appendix had been removed and the abdomen drained. On examination the uterus was found to be anteverted, not enlarged and dextroverted. There was a tender cystic mass in the right fornix and a small mass in the left fornix. She was considered to have chronic salpingitis resulting from the previous attack of acute appendicitis. An attempt was made to inject lipiodol on November 25, 1936, but none entered the uterus, and it appeared under the X ray screen to run back into the vagina. An X ray picture taken next day showed no lipiodol shadow. About two weeks later the patient developed pelvic peritonitis, which was treated conservatively in hospital. The abscess ruptured into the vagina about twelve days later and her condition settled down. When she was last seen, on April 28, 1938, there was a small mass in the right fornix, which was not very tender.

The most probable explanation is that the manipulations necessary for dilatation of the cervix had stirred up a latent infection.

Conclusion.

In conclusion I should like to admit to the many shortcomings in this paper. I am fully aware that many aspects of the problem of sterility have not been mentioned, especially those that could be grouped under the heading of functional sterility. The reason for their omission is their complexity and the consequent fact that there is not enough space in this paper for them to be dealt with fully.

The following aspects of sterility, as given by Kurzrok,[3] are worth considered thought:

Intercourse, when accompanied by orgasm in the woman, is followed by an increase of female sex hormone in her urine next day, with a consequent stimulus to her ovaries and uterus. If orgasm does not occur, then an increase of the hormone does not follow.

Premenstrual biopsy of the uterine endometrium will show whether the secretory phase is absent.

This condition is known as anovular menstruation, and of course pregnancy cannot occur when it is present.

When glandular therapy is used in the treatment of sterility, too much or too little of the hormone should not be given, and it should probably not be given during the secretory phase of the menstrual cycle. Very large doses prolong the cycle and postpone ovulation.

Acknowledgement.

I should like to thank Dr. A. D. D. Pye, the general medical superintendent of the Brisbane and South Coast Hospitals Board, for permission to publish the histories of patients seen at the Brisbane Hospital.

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MALARIAL NEPHRITIS (NEPHROSIS) IN THE SOLOMON ISLANDS AND MANDATED TERRITORY OF NEW GUINEA.

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EVERY now and then a native, frequently a child, is brought to hospital suffering from swelling of the body, especially of the face, legs and scrotum, from ascites, and from an enlarged malarial spleen. The urine on being tested shows a heavy cloud of albumin, with casts, renal cells, leucocytes, and often scanty red blood cells. Examinaton of the blood will reveal anæmia of malarial origin and malarial parasites, usually of the quartan variety. (Any quinine taken prior to the examination will increase the difficulties of finding the parasites.) There is no increase in the blood nitrogen level, nor is the blood pressure raised. The history of the œdema is a short one, but that of the malaria a long one. The patient is a chronic malarial subject. The severity of the symptoms varies, severe cases being in the majority. Efficient treatment by quinine usually produces a rapid and dramatic recovery. The condition is one of malarial nephritis (nephrosis).

This paper is based upon the observaton of 22 patients suffering from this disease (two suffering from relapses) treated by me during ten years' practice in native hospitals in the Solomons (western and central) and in the Mandated Territory of New Guinea (New Britain).

Clinical Features.

An analysis of the cases shows the following:

Incidence.—The frequency of the condition can be gauged roughly by these 22 cases having occurred amongst a total number of 6,518 patients admitted to hospital during the period of ten years.

Age.—Of the 22 patients 80% were under seven years of age, 16% were between twenty and thirty years, and 4% were between thirty and forty.

Sex.—Of these patients 60% were females and 40% males.

Urinary Findings. — Albuminuria varied in amount with the severity of the œdema. In mild cases the volume was one-eighth to one-sixth; in severe cases it was one-third to one-half. Other findings included the presence of casts, mostly hyaline and granular; in two cases cellular cysts were present. Renal cells, leucocytes, and, in 50% of cases, red blood cells, were found, though in scanty numbers. The urine was centrifuged.

Evidence of Malaria.—The spleen was enlarged in all instances. In two-thirds of the cases it reached to or extended below the umbilicus.

Anæmia resulted from the malaria. Apart from one severe case in which the hæmoglobin value was 15% and another in which it was normal, the average value was 60%.

Blood films examined (15) showed malarial parasites in 53%. The species of parasite found were as follows: quartan (*Plasmodium malariæ*), 64%; quartan with benign tertian (*Plasmodium vivax*), 12%; quartan with subtertian (*Plasmodium falciparum*), 12%; malarial rings of undetermined type, 12%. The notes of the films in five further cases have been lost; from memory I should say that they were predominately quartan also.

Length of History of Nephritic Symptoms.—In nine cases there was no relation between the length of history and the severity of the symptoms. In three cases the history was of one week's duration, in three cases two to four weeks, in one case two months, in one case one month, and in one case the history was recorded as being long.

The Severity of Symptoms.—Severe cases, those in which œdema of the face, legs, scrotum and body, and ascites as well, were present, numbered 68%; mild cases, those in which œdema of face and feet was slight, numbered 18%; the moderately severe cases numbered 14%.

Mortality.—Of eight patients treated by quinine by mouth, five died (62·5%). Of fourteen patients treated by intramuscular injections of quinine, one died (7·0%). In three cases in the last-mentioned group quinine was supplemented by "Atebrin".

Progress.—With efficient treatment, the œdema subsides rapidly, the temperature drops in two to three days, and the albuminuria disappears. In severe cases the albuminuria disappears rather more slowly than the other symptoms. After a period of quinine treatment, "Atebrin" was given in three

cases; two patients received the drug by mouth, and one by intramuscular injection ("Atebrin musonate"). In these cases the condition had cleared up well to a point, but either a small persistent rise in temperature or a little œdema and albuminuria remained. In all the condition responded to the "Atebrin".

Pathology.

Unfortunately no *post mortem* examinations were made in these cases, but the pathology has been studied by other workers. Giglioli[2] in British Guiana found that the condition follows chronic untreated malaria, especially of the quartan type. In five *post mortem* examinations, he found in early cases enlarged kidneys, thickened cortex and degenerative lesions. In old cases, typical secondarily contracted kidneys were found with inflammatory and proliferative lesions. In his earliest case, that of a child with severe œdema (his Case II), the glomeruli were practically unaffected, while diffuse degeneration of the convoluted tubules was present. Surbek[7] in Sumatra, dealing with an acute affection in a man of twenty-five years of age, found *post mortem* similarly a degeneration of the tubules, which were filled with coagulated masses and desquamated epithelium. The glomeruli were only slightly affected. Menon and Annamalai[6] found a similar picture in a woman dead of this disease, there being malarial pigment in the cells of the tubules.

It would seem that in the early cases tubule degeneration is associated with the picture of nephrosis, while in older cases inflammatory changes involve the glomeruli also, and there develops the picture of a chronic nephritis with liability to uræmia. Giglioli states that malarial nephritis (quartan) shows much the same characteristics as the nephritis caused by pyogenic infection.

Treatment.

My results can be divided into three consecutive groups.

The first group includes eight cases in which quinine was given by mouth. The mortality was 63%, that is, every patient whose condition was severe died.

The second, a transition group, includes one case in which the above-mentioned treatment was used. After ten days the patient was worse, and the urine had diminished to four ounces in three days. Treatment was changed, the intramuscular route being used; the temperature promptly dropped, the œdema diminished dramatically; and on the seventh day only a faint trace of albumin remained.

The third group includes thirteen cases in which intramuscular injections of quinine were given as a routine measure. One patient died, a mortality of 7%. This one patient was a man of thirty-eight years of age, with a long history of œdema and a weak heart. He developed an abscess at the site of a badly given injection, and he died following a small incision to evacuate the pus. He received insufficient quinine injections. His infection was severe, and most probably all the pathological changes described by Giglioli in his old cases were present; death was due to uræmia.

Amongst the patients recovering were those with symptoms as severe as any I have met.

The explanation of the above results lies in the fact of the œdema affecting the digestive tract also, as Surbek[7] showed in his case. Insufficient quinine is absorbed from the alimentary tract to kill the malarial infection.

Dosage and Method of Administration.—An adult received 0·58 gramme (nine grains) of quinine bihydrochloride dissolved in two cubic centimetres of water, and injected every day deeply into the gluteal muscles at a point in the adult one hand's breadth below the highest point of the iliac crest. A child of four to five years of age received 0·19 gramme (three grains) and children of other ages received proportionate doses. Daily doses are continued for from four days to a week, the time depending upon the subsidence of the œdema, after which the quinine is continued by mouth, 0·32 gramme (five grains) being given three times a day.

A long needle was used, as the thickness of the tissues is increased by the œdema. The injection must be an intramuscular one, and it is a good plan to make gentle contact between the needle and the bone, and then to withdraw the needle a little. The injection will then be made into the muscle. To be certain of the asepsis of the needle and syringe, it is well to run some ether through them. I have given very many injections of quinine, and have never had anything go wrong.

Discussion.

My figures show that, while malarial nephritis may affect persons of any age, it is a disease mostly of young people. They agree with those of Surbek in Sumatra,[7][8] Giglioli in British Guiana,[2][4] and Carothers in East Africa.[1]

Similarly, as regards the role of the quartan malarial parasite, the findings are the same as those of Surbek,[7][8] Giglioli[2][3][4] and Carothers.[1] Goldie[5] thinks that any form of malaria which has become chronic may cause nephritis, but that since quartan malaria, being less acute than the other forms, does not drive people for treatment, infections of this type are more liable than others to become chronic. This theory does not hold in my experience, because there are so many areas in which no treatment at all is available, and all types of malaria remain equally untreated. On the island of Choiseul, my hospital was the first treatment centre to be established.

Finally, what is the real incidence of nephritis due to malaria, and nephritis due to other causes?

Let me say at once that, with the addition of one case (see below), these 22 cases comprise all the cases of all kinds of nephritis that I have met. I have had no others. As well, in 500 antenatal examinations I found only one case of albuminuria and it was due to an old pyelonephritis.

ILLUSTRATIONS TO THE ARTICLE BY Dr. DAVID B. ROSENTHAL.

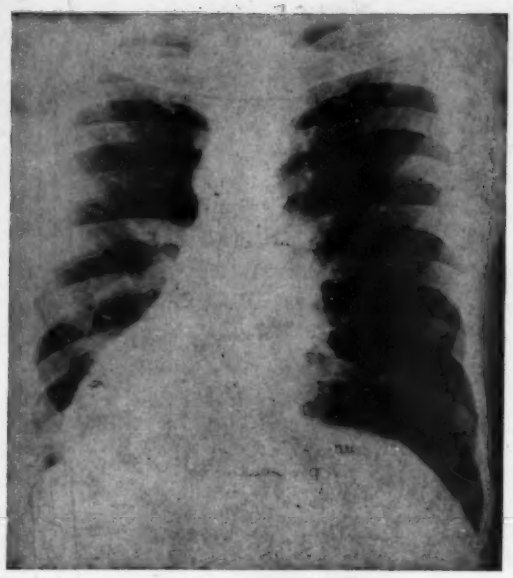

Figure I.

Figure II.

Figure III.

Figure IV.

ILLUSTRATIONS TO THE ARTICLE BY Dr. GEORGE SWINBURNE.

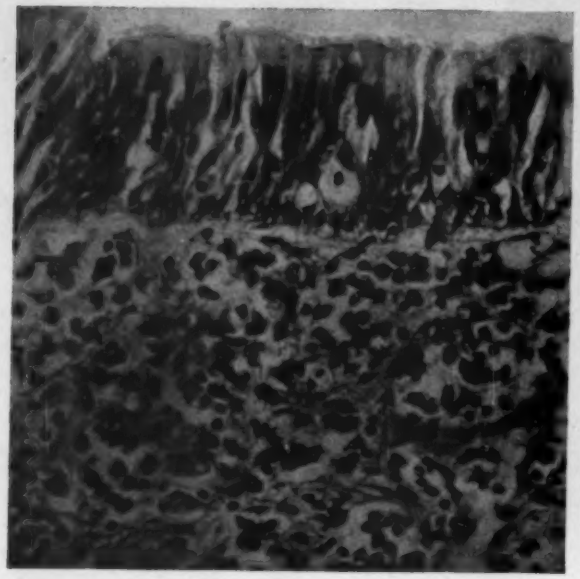

Figure I.
Ciliated columnar epithelium lining the cyst. × 240.

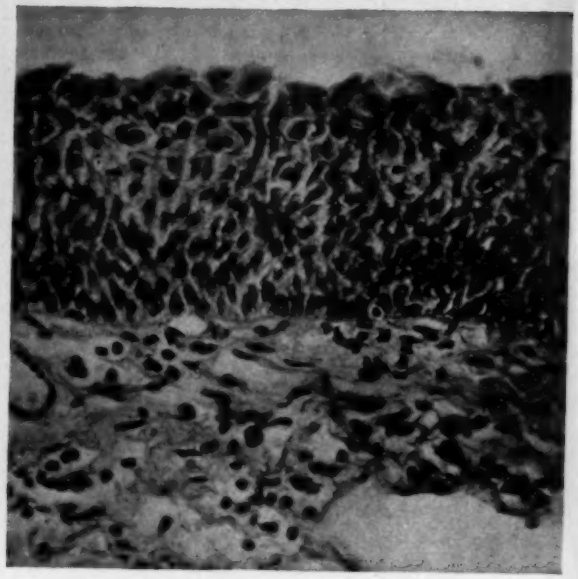

Figure II.
Transitional epithelium covering the middle zone of the cyst. × 240.

Figure V.
Cross-section of the cyst opened along its attached border. × 4.

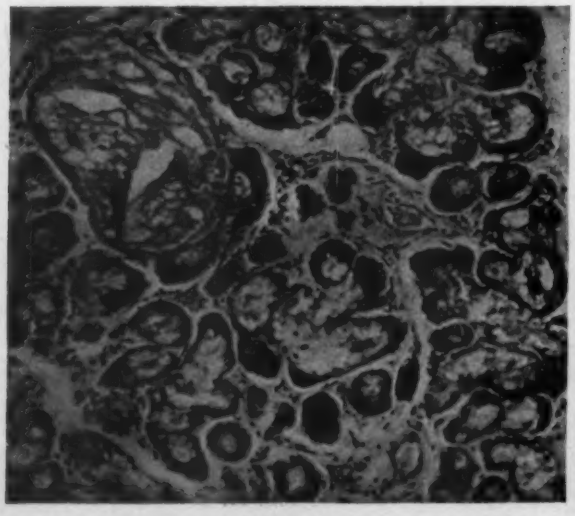

Figure III.
Showing dilatation of alveoli. × 90.

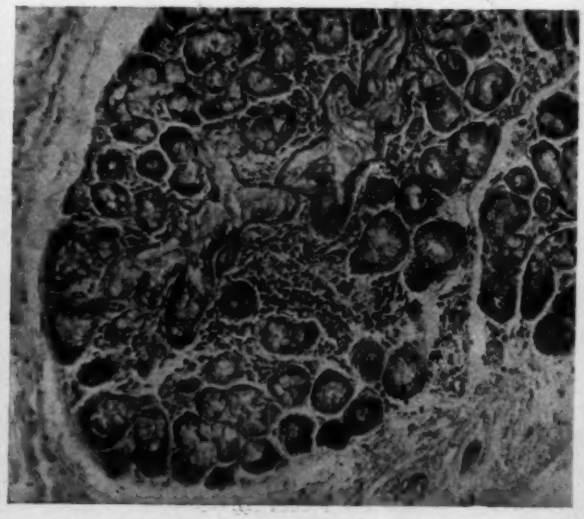

Figure IV.
Showing dilatation of smaller ducts and alveoli. × 120.

The one case referred to as an exception was that of a woman of thirty-eight years of age seen at the out-patient department and not sufficiently investigated. The findings were a very enlarged spleen, a high blood pressure, enlargement of the heart, œdema, albuminuria, and symptoms of uræmia. This may or may not have been due to malaria.

That all the cases above were due to malaria can hardly be doubted.

1. They were all a straight series of one type, each resembling the next, with variations only in severity.

2. An enlarged malarial spleen was present in every instance.

3. Of the blood films, 53% showed malarial parasites. That the blood can be free of malarial parasites even when the patient is dying from malarial nephritis is shown in two of the five *post mortem* examinations of Giglioli mentioned above in which examination of blood films showed no malarial parasites during the fatal illness. Further, having fever, these patients on the way to hospital frequently managed to be given quinine by a missionary or other person. One actually received an injection of quinine. In these circumstances the chances of subsequently finding the parasite in the blood are much diminished.

4. Efficient quinine therapy was successful.

Sceptical of my findings, I treated on ordinary lines for two weeks a patient who had œdema of face and feet, albuminuria, a very slightly enlarged spleen, a normal blood value, and a malaria-free blood film. The œdema increased, but promptly disappeared after two injections of quinine.

The conclusion must be that much of the nephritis, especially in children, in these parts of the Pacific (possibly the closely related northern Australia may be included) is of malarial origin, and should be treated primarily with efficient quinine therapy, this being supplemented with "Atebrin" if necessary, until it be proved to be non-malarial. Not every patient needs injections, but it is better to err on the side of injections than to trust to quinine, given by mouth, which may not be absorbed. In severe cases it is wasting precious time to give quinine by mouth.

Summary.

Twenty-two cases of malarial nephritis are reviewed. The chief symptoms were œdema, ascites, albuminuria, an enlarged spleen and anæmia. Blood films showed malarial parasites—mostly of the quartan variety—in 53% of cases. Of the cases 68% were severe. Blood nitrogen level and the blood pressure were normal.

The patients were all natives of the south-western Pacific, that is, the Solomon Islands and the Mandated Territory of New Guinea.

Of the patients 80% were children under seven years of age.

The history of the œdema *et cetera* was a short one, but of the malaria, a long one.

Efficient quinine therapy *plus* "Atebrin", if necessary, brings about a dramatic recovery.

In early cases degeneration of epithelium of convoluted tubules is the prominent pathological feature. In old cases the glomeruli are also affected, and proliferation and inflammation are present; eventually a secondarily contracted kidney results. The early stage is associated with nephrotic, the later stage with nephritic symptoms.

When quinine was given by mouth in eight cases, five patients died. When quinine was given by intramuscular injection in fourteen cases, one patient died; death was due in this instance to intercurrent disease and uræmia; the patient gave a long history and had a weak heart.

Dosage is described, and the necessity for using a long needle and for careful asepsis is emphasized.

The conclusion is reached that much nephritis in the south-western Pacific is due to malaria, and should be treated by daily intramuscular injections of quinine, especially in severe cases, until the œdema has subsided, and until the quinine can be absorbed when given by mouth.

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BRONCHIECTASIS AND VISCERAL TRANSPOSITION, WITH REPORT OF A CASE.

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COMPLETE transposition of viscera has been recognized since the Middle Ages, having been described in 1650 by Riolanus, and by Morand in 1660, whilst Méry, in a racy quatrain, attributed the condition to "*La nature en débauche*".(7)

Young[17] and Davis[5] have each placed on record the autopsy findings in cases of complete transposition of viscera, the subjects being an elderly woman who had died suddenly from an unknown cause, and a middle-aged man with an aortic lesion. In both cases the lungs were healthy.

The association of this type of developmental irregularity with diseased conditions of viscera has been the subject of much discussion; but it would appear that it is to Kartagener, whose writings are quoted below, that credit is due for the direction of attention to the frequency with which bronchiectasis occurred in cases of transposition of viscera. Kerley[9] refers to Kartagener's published cases of associated bronchiectasis and transposition of viscera, stating that the number of these cases precludes the possibility of coincidence.

The argument is fully elaborated in an interesting review by Adams and Churchill,[1] who survey the literature and discuss the frequency of occurrence of transposition of viscera, and its association with bronchiectasis, and of bronchiectasis with sinus infection. They quote Guenther's figures for the incidence of *situs inversus* discovered by clinical examination; he gave the incidence as five cases in 63,000, as compared with 3 cases in 22,000 discovered at autopsy. Guenther's conclusion was that *situs inversus* was a constitutional anomaly, which might or might not be associated with other anomalies. Adams and Churchill also discuss Kartagener's case reports and opinions with reference to Kartagener's syndrome—*situs inversus*, sinusitis and bronchiectasis. Kartagener considered that the sequence (*sic*) was explained "on a common factor, namely an anomaly, and therefore the bronchiectases were congenital". Sauerbruch's contention that 80% of cases of bronchiectasis are congenital was quoted by Kartagener as supporting evidence.

Adams and Churchill report five cases, in all of which bronchiectasis was associated with gross nasal infection and *situs inversus*. The bronchiectasis in all cases was of the cylindrical or fusiform type; in two cases the regions affected were the base of the right lung, and the middle lobe of the left lung, as in the case here reported. In two there was a history of hæmoptysis. In each, examination of the nose and throat and associated areas revealed gross sinusitis, the presence of nasal polypi and deviation of the nasal septum. Interesting figures relating to 232,112 patients admitted to the Massachusetts General Hospital over the period 1886 to 1937 are given. The diagnosis of bronchiectasis was made in 712 cases (0·306%). *Situs inversus* was present in 23 cases (0·002%). Bronchiectasis occurred in five of these 23 cases (the reported cases), an incidence percentage of 21·7. The relationship between sinusitis and bronchiectasis is briefly discussed, the statement being made that in about 90% of the cases of bronchiectasis generally encountered infection of the accessory nasal sinuses is present. It appears difficult to decide whether one or other of these conditions is primary, or if both may be due to a common underlying element. The association of *situs inversus* and bronchiectasis allows of no readily acceptable explanation. After discussing theoretical aspects of embryology and teratology, Adams and Churchill conclude:

> . . . that there may be two types of individuals with transposition of viscera—first, completely normal mutants and second, true monsters in whom other stigmata of maldevelopment may be anticipated; the inference is that the bronchiectasis in these cases is to be regarded as a stigma of maldevelopment.

Ellman[6] has reported a case of dextrocardia in a man, aged twenty-one years, with physical signs of congenital pulmonary stenosis. The electrocardiogram revealed typical inverted waves. Radiographic examination after a barium meal revealed transposition of viscera. Chest examination revealed signs of infiltration in the upper zone of the left lung, with post-tussive crepitations. An X ray film revealed pulmonary fibrosis, with possible cavitation in this region. The cardiac shadow showed prominence corresponding to the pulmonary conus. (Neither sputum tests nor the results of tests for reaction to the injection of tuberculin are mentioned.)

Newns[14] reported the occurrence of complete transposition of viscera in a six-year-old boy "who had always been subject to attacks of bronchitis". Examination revealed dextrocardia and reversal of the abdominal viscera. An X ray film of the chest revealed "some mottling in the lungs". The Mantoux test elicited no reaction. The blood sedimentation rate was seven millimetres in one hour. The blood picture was that of secondary anæmia. The electrocardiographic curve was not typical of dextrocardia, as the *P* wave in the first lead was not inverted, although the *T* wave was. This was considered as being due possibly to a congenital lesion in the heart. (It is suggested that X ray examination of the bronchial tree with lipiodol, in Newns's case, might have demonstrated a condition of bronchiectasis, probably congenital.)

Stevenson[16] reported a case of dextrocardia, in which the remainder of the viscera were normally situated. The lungs were apparently normal. He referred also to the detailed autopsy on a subject with complete transposition of viscera, no pulmonary disease being noted.

The following case report describes the occurrence of "Kartagener's triad" in a young man who was also suffering from chronic nephritis.

Case History.

J.V.W., a male, aged twenty-eight years, a wool-sorter, was admitted to the sanatorium for observation of his pulmonary condition. He knew that "his heart and some of his organs were on the wrong side". At the age of eight years, he had been treated for "bronchitis", and had had a cough with sputum, occasionally blood-streaked, ever since. More recently, the cough was more troublesome and blood-streaking more frequent. Dyspnœa on exertion was noticed. He felt "off colour" and was very readily fatigued. Swelling of the legs and feet occurred, and he was admitted to the Alfred Hospital, Prahran. He was found to be suffering from subacute nephritis, with pyrexia, the temperature rising to 38·4° C. (101° F.) in the evening. Albuminuria was present; the systolic blood pressure was 180 millimetres of mercury and the diastolic 110. The blood urea content was estimated to be 46 milligrammes per 100 cubic centimetres. The sputum was examined on two occasions for tubercle bacilli, but none were seen. The urine also contained no tubercle bacilli. The ocular fundi were normal. Transposition of the viscera was noted. The temperature gradually subsided with treatment and the œdema cleared up. The cough became less troublesome. At the time of the patient's transfer to the sanatorium, his systolic blood pressure was about 165 millimetres of mercury, and albuminuria was still present.

The patient had no knowledge of any abnormality in relatives. His wife and three children were all well.

On examination he appeared a healthy man with a florid complexion. He was rather "full" under the eyes. There was no palpable œdema of the face. His weight was 63·5 kilograms (10 stone) and his height 167·5 centimetres (five feet seven inches). The configuration of the thorax was normal.

The apex beat was in the fifth intercostal space, about five inches to the right of the mid-line; there was no left cardiac dulness. There was a soft first sound at the apex, with a systolic bruit at the pulmonary area (in the second right intercostal space), and the aortic area (at the second left costal cartilage). This was most evident on full expiration. The second sound was clear and the rhythm regular. The systolic blood pressure was 150 millimetres of mercury and the diastolic 90. The pressure was equal in both arms.

Examination of the lungs revealed an impaired percussion note and diminished breath sounds of the bronchial type at the base of the right lung, with a few crepitant râles. A few râles were scattered elsewhere.

On examination of the abdomen the liver was dull to percussion in the left hypochondrium. Tympanites was present in the right hypochondrium. There was no free fluid. The spleen and kidneys were impalpable.

Examination of the central nervous system revealed that the mental condition and the deep and superficial reflexes were normal. The patient was right-handed.

Slight clubbing of the fingers was present.

Examination of the ears, nose and throat revealed nasal polypi, gross pharyngitis, sinusitis and deviation of the nasal septum.

The patient was kept under observation for about one month. During this time there was a noticeable improvement in his general state; his weight increased by 3·2 kilograms (seven pounds), his cough and sputum decreased, and his energy returned. The temperature was generally within normal limits, with an occasional evening rise to 37·8° C. (100° F.).

Investigations and Results.

Several X-ray examinations were made. A skiagram of the chest is shown in Figure I, a postero-anterior film. The main feature is dextrocardia, the heart appearing as the mirror-image of the normal. The pulmonary conus is not unduly conspicuous, whilst the aortic knob is well defined to the right side. The heart is displaced slightly to the right, probably as a result of the pulmonary condition. Irregular fibrosis is seen in the basal half of the right lung field, associated with a general increase in detail of lung markings. The line of the interlobar pleural plane is well defined opposite the posterior part of the eighth rib on the left side. This indicates a tri-lobed left lung.

Figure II is a postero-anterior skiagram of the chest, after the instillation of lipiodol. Figure III is a left anterior oblique skiagram. The films reveal bronchiectasis of fusiform type, affecting the basal lobe of the right lung and the middle lobe of the left lung.

Figure IV is a skiagram of the intestinal tract taken after a bismuth meal. It is a postero-anterior film, taken with the patient in the upright position. The film shows the right-sided stomach, with the pylorus directed towards the left. The hepatic shadow is in the left upper quadrant. The hepatic flexure is just beneath, with the ascending colon and the cæcum on the left side. The appendix is medially placed on the cæcum on the left iliac fossa.

The sputum was examined by the Ziehl-Neelsen test, and no tubercle bacilli were seen. Gram-positive cocci were present.

Examination of the urine revealed albumin. Microscopically, pus cells, a few red blood cells and a few granular casts were seen. No tubercle bacilli were seen.

The blood sedimentation rate was tested by Cutler's method. It was 27·5 millimetres in one hour. The test was conducted at a temperature of 17° C. (62° F.).

The ocular fundi were normal.

The intradermal tuberculin test elicited no reaction with 0·01 milligramme or 0·1 milligramme of tuberculin.

It is worthy of note that during the instillation of lipiodol, which was performed by the transnasal route, the patient coughed up a considerable amount of offensive sputum, provoked by the manipulation of the catheter in the trachea and the instillation of the oil. This was the only occasion on which sputum of this type was obtained.

The nature of the heart sounds suggested the possibility of congenital pulmonary stenosis, but the evidence was too scanty to allow of more than conjecture as to the presence of a valvular lesion or abnormality.

Discussion.

The patient has transposition of viscera, complete within the limits of examination, and certainly affecting the heart and great vessels, the lungs, the liver and the gastro-intestinal tract. There is also a condition of bronchiectasis, which has been present probably since early childhood, and which may have been congenital. The duration of the nasal and sinus infection is not known. Allowing the frequency of association of bronchiectasis and sinusitis, which will be discussed later, are we to accept the dextrocardia and bronchiectasis as partners in an anomaly, or should the coexistence of these conditions be regarded as purely fortuitous? The mode of development of the bronchi down to the terminal ramifications, from the entoderm of the primitive foregut, suggests no intimate relationship with the developing cardiac tube other than mere contiguity. But in view of the anatomy of the bronchial tree and the broncho-pulmonary segments, the asymmetry and the relation to the heart are most striking. It may be agreed that the absence of the eparterial bronchus from the left side (in the normal) is perhaps due to its suppression to permit the normal recession of the aortic arch. Likewise, the inclination of the heart causes a suppression of the second ventral bronchus in the normal left lung, and affords opportunity for its development in the right lung to form the mesial bronchus.[11] [13]

Hirschfelder[6] states that dextrocardia is brought about by a change in position of the cardiac tube in early embryonic life, so that it lies in the position of an *S* reversed instead of the normal *S*. In complete transposition, the organs develop normally, and the condition has no effect on function. With this view, Norris and Landis[15] concur:

> Complete transposition of viscera interferes in no way with the normal functions and is usually discovered accidentally during a routine examination. It has no clinical significance.

It would appear therefore that a bilobed right lung and a trilobed left lung should be associated naturally with dextrocardia; but there appears to be no valid reason for presupposing that the latter should be accompanied by other abnormal formation in the bronchial tree rather than elsewhere in the body.

If we turn to the question of the ætiology of bronchiectasis, it will be noted that most writers are agreed on the frequency of sinusitis. Boyd[2] states that suppuration of the nasal sinuses with the constant discharge of septic material into the bronchi is probably one of the major factors. Brunn and Faulkner[3] consider that there are two types of bronchiectasis: bronchiectasis of short duration with a history of influenzal attacks, and bronchiectasis of much longer duration, which appears to have begun in early childhood. The latter is the commoner type. Brunn and Faulkner regard it as uncommon not to find sinusitis accompanying bronchiectasis.

Lander and Davidson,[10] on somewhat slender clinical evidence, however, consider that mechanical factors play the most important, if not the sole, part in the production of bronchial dilatation, and that the role of infection is secondary and by no means inevitable.

Muir,[12] whilst not rejecting the infective origin of the weakening and dilatation of the bronchi, tends to favour the mechanical theory, and stresses the importance of forced inspiration.

It might be noticed that in *bronchiectasis sicca* infection is conspicuously absent, and a congenital origin is likely. In this type the disease is frequently unilateral, and unilateral bronchiectasis affects more commonly the left side.[2] [4]

Mechanical obstruction of the main bronchi, of purely anatomical origin, would be more likely to occur on the left than on the right side, with the normally placed heart and great vessels. As dextrocardia is a mirror-image of the normal, similar pressure effects (if any) might be expected, related to the opposite side.

It will be noted that in all five of Adams and Churchill's cases, and in this case also, bronchiectasis affected the basal lobe of the right lung, either alone or as part of a more extensive pulmonary involvement.

Autopsy has failed to reveal bronchiectasis in the cases referred to above; but bronchiectasis may have been missed unless especially looked for, or unless of gross degree. By reason of the nature of the tissue involved, a degree of bronchiectasis that would be manifest during life by X ray examination with a contrast medium might be difficult to demonstrate in an unprepared autopsy specimen.

It is suggested that all patients with dextrocardia (with or without complete transposition) should be subjected to X ray examination of the lungs with lipiodol to establish the presence or absence of bronchiectasis.

In a survey of the evidence it would appear that there is no logical support for the assumption that there exists a direct relationship between *situs inversus* and bronchiectasis. Adams and Churchill's view that individuals who display this association of lesions are to be regarded as true monsters, in whom "other stigmata of maldevelopment may be anticipated", lacks scientific precision, and indeed explains nothing. Various suggestive points have been examined. Should any individual with *situs inversus* develop sinusitis, he would share with others similarly infected (but with normally placed viscera) the same risks of developing bronchiectasis unless bronchiectatic dilatations were already present. Of this there is no evidence.

The renal condition mentioned in the case history has been regarded as one of chronic nephritis rather of the lipoid nephrosis type. Those who favour the "developmental" theory may find a modicum of support and comfort in the close resemblance between the syndromes of chronic nephritis and congenital cystic disease of the kidneys.

Summary.

1. A case is reported of complete transposition of viscera, with bronchiectasis and sinus infection.

2. The association of these conditions, with brief reference to their ætiology, is discussed.

3. While it appears clear that the frequency of coexistence of *situs inversus* and bronchiectasis is greater than can be attributed to coincidence, no satisfactory explanation of this association has been advanced.

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Reports of Cases.

NASO-PHARYNGEAL CYST.

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NASO-PHARYNGEAL CYSTS are uncommon and references in the literature are few. No reference to a cyst exactly comparable with the one described in this paper could be found in the available literature; for this reason, as well as for its own interest, this particular example was felt to be worthy of record.

Clinical History.

In June, 1937, a female patient, aged fifty-nine years, was referred to me by her family physician, with the following history.

For twenty years or more she had noticed in her naso-pharynx an oval mass about three-quarters of an inch in length, which she had often been able to grasp with her finger and thumb. It did not cause her any concern and she had been told by two medical men not to worry about it.

About two weeks before she reported it had increased in size till it interfered with nasal breathing. Then an unpleasant taste was noticed, with an irritating discharge running down the back of her throat from above the cyst.

Her general health otherwise had been good. On examination a smooth rounded mass could be seen projecting below the soft palate behind the left posterior faucial pillar. On retraction of the posterior pillar this

mass could be seen and felt to extend upwards, almost completely filling the naso-pharynx, and attached to the left side of its postero-lateral wall.

The mass was about 2·5 by 1·25 by 1·25 centimetres (one inch by half an inch by half an inch) in size, was roughly bean-shaped, felt cystic and was translucent to light. The mucous membrane over it was unimpaired. It was freely movable on an attachment extending from just below and behind the upper pole of the left tonsil to just below the left Eustachian orifice. Nose, larynx and ears were normal. One small gland was palpable at the angle of the jaw on each side.

In regard to diagnosis, nasal polypus, naso-pharyngeal fibroma, lipoma, cyst of Rathke's pouch, solitary lymph cyst, hæmangioma and aneurysm were readily excluded on clinical grounds. One was left with a pre-operative diagnosis of cyst of unknown origin, possibly "simple", possibly to be regarded as "branchial" in type.

At operation, with no interference with the soft palate, the cyst was dissected off from the wall of the pharynx and the pedicle below the Eustachian orifice was snared. This pedicle appeared to be composed only of mucous membrane and submucous fibrous tissue. In the later stages the cyst unfortunately burst and yellowish opalescent contents escaped and disappeared down the sucker catheter. None of the contents was obtained for examination, but the opalescence suggested cholesterol crystals; though in the light of the later microscopic findings, a semi-purulent condition might account for the appearance of the fluid. The wound had healed uneventfully within four weeks of the operation. There has been no recurrence to date—nine months after removal.

Pathology.

On macroscopic examination the specimen proved to be a cyst of the dimensions mentioned above. The cavity was lined by rugose epithelium; the wall was of fairly uniform thickness, about two to three millimetres, with an increase, of course, on the side of the pedicle. The cyst contained some flakes of purulent looking material and was intact and complete on removal, except for one small hole where most of its contents had escaped.

Microscopically the lining membrane consisted of ciliated columnar epithelium similar to that lining the nose and nasal accessory sinuses (see Figure I). The covering epithelium was transitional over the upper part and stratified squamous in the lower part (see Figure II). Some fibrin with enmeshed leucocytes was lying free within the cyst. Just beneath the lining epithelium was a zone of congestion showing marked round-celled infiltration, which was quite sharply demarcated from a vascular connective tissue zone extending to the covering epithelium. No lymph adenoid tissue, such as is found in vestigial remnant cysts, was present. Beneath the covering epithelium several large veins were observed. Skeletal muscle was present in the pedicle. In the vascular connective tissue zone on an average fourteen masses of salivary gland tissue were seen in different slides, usually all except one mass being grouped about the pedicle area. These showed an even distribution of mucous and serous alveoli with serous demilunes at the periphery of many of those of the mucous type. Marked round-celled infiltration was present in the interalveolar supporting tissues in several of these salivary gland masses, without a similar infiltration in the connective tissue immediately surrounding them. Numbers of the ducts and alveoli of these salivary glands showed dilatation and distension with secretion (see Figures III and IV).

Discussion.

In connexion with the so-called branchial cyst in the naso-pharyngeal region, J. E. Fraser has pointed out that the objection to the use of the word "branchial" lies in the fact that these things are not branchial in the strict sense and have nothing to do with branchiæ.

The human embryo possesses a series of visceral arches in the floor of its pharynx with intervening visceral grooves, not clefts; these arches do not correspond with the branchial arches in fishes.

There is a large volume of literature on the subject of these so-called branchial cysts, the details of which are beyond the scope of this paper; but if this particular cyst did develop in a vestigial remnant its position would suggest that it arose in connexion with the internal end of the second visceral groove.

In the human embryo each of the four visceral grooves which lie behind their corresponding arches, ends in a deep lateral pouch with a corresponding external groove, the lining entoderm and ectoderm of these being practically in contact.

The lateral pouches have dorsal and ventral angles, the surface of contact with ectoderm extending from one to the other. In the first pouch there is no ventral angle, only the upturned dorsal angle.

In the second pouch the distance between the angles increases; the upper dorsal angle remains in the middle ear, the lower or ventral angle is placed in the tonsillar fossa.

As the neck grows, the fourth, third and second ventral angles and external arches and grooves are covered over by the formation of the pre-cervical sinus, which is formed by an extension backwards of a fold from the dorsal aspect of the second arch in front to the pericardial region behind. With this growth of the neck these visceral grooves are elongated, giving strands of cells which may contain a lumen forming the external and internal pharyngeal ducts described by Fraser, with a solid intervening plate of cells—the closing plate.

Hamilton Bailey divides the cysts in connexion with the second visceral groove and pre-cervical sinus into four clinical types, mainly according to their depth from the surface and their relation to surrounding vessels and nerves; for these cysts have definite fixed relations to the main vessels and nerves if these are normal. Bailey's fourth class, which is lined by ciliated columnar epithelium, he concludes may be from either the second internal duct (of Fraser) or from one of the epithelial bodies which are found in association with the pouches; or, he adds, it is possibly, in spite of its epithelium, an ectodermal derivative or one associated with the closing membrane. However, in view of the superficial internal position of the cyst in question here, we can exclude the last two possibilities, and it is probable that Bailey's description of his fourth class would apply to a deeper cyst nearer the great vessels.

The opening of the ventral angle of the second pouch is in the supratonsillar fossa; but there is a possibility that the cyst could have arisen in one of the epithelial bodies in association with this pouch or in connexion with the surface of contact with ectoderm which originally extended from the dorsal to the ventral pouch, as described by Fraser.

Against the development of the cyst in a vestigial remnant are its superficial position in the submucous layer of the naso-pharynx and the absence of any connexion by fibrous or other tissue with the deeper structures, the fibrous connexion being the obliterated remains of the second internal duct which passes outwards towards the space between the two carotids.

It would therefore seem that on the grounds of position the vestigial remnant hypothesis would not explain the facts without considerable stretching of the hypothesis to fit them, quite apart from the fact that to explain them by this hypothesis at all one has to assume a change in development.

If this cyst were an ante-natal development it seems odd that it should have remained latent for so long, for it apparently did not develop until the patient was thirty-five to forty years of age.

In this case the probability is that one of the mucous glands in the region had become changed and that this change was possibly associated with a blocking of the duct, which, when secretion collected, became either absolutely or relatively complete, owing to stretching and distortion of the orifice of its normal tiny lumen.

There are a number of possibilities in this connexion.

A mucous gland acinus itself may become obstructed in its outlet to the duct, with accumulation of mucus

and secretion (see Diagram I); or a collection of acini (see *B* in Diagram I and Figure III) may be cut off from a terminal ductule and become distended, with ultimate atrophy of the interacinar walls owing to stretching and interference with blood supply; or the cyst may be the greatly dilated portion of a duct itself and a greater number of acini, after the manner of *C* in Diagram I.

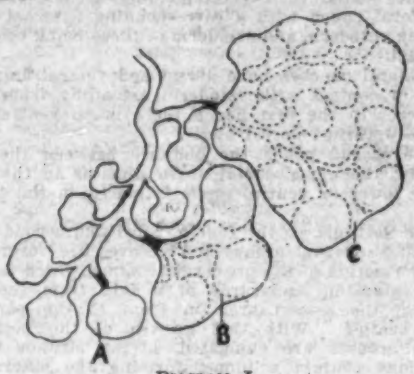

DIAGRAM I.

Showing the stages of cyst formation (see text). *A*: single alveolus; *B*, *C*: collections of alveoli, which by obstruction of their duct may become dilated.

There is histological evidence of similar changes on a small scale in the salivary gland collections in the wall of the cyst (see Figures III and IV); and a simple explanation of the formation of the cyst, such as this, fits the facts and the question of developmental changes is not raised.

Both the vestigial type and the simple cyst are subject to recurrent attacks of acute inflammation, and if there are none of these they may lie dormant for years, an acute inflammatory attack finally causing an uncomfortable and alarming increase in size. Evidence of the inflammation is found in the subepithelial round-celled infiltration and in the fibrin with enmeshed leucocytes lying free within the cyst.

On examination of the cyst from the point of view of its lining epithelium, what is admittedly a vestigial remnant cyst in the second internal duct would most probably be found to be lined with ciliated columnar epithelium. A layer of lymphoid tissue is nearly always found beneath the lining epithelium in the vestigial remnant type of cyst, but was absent from this one.

A simple cyst developing in a mucous gland may be lined with either columnar, ciliated columnar, squamous or a transitional type of epithelium, the last two the result of a metaplasia from the repeated inflammations. There are many recorded examples of this change of epithelial type in such circumstances in practically every epithelium-containing organ in the body (for example, gall-bladder, thyreoid *et cetera*).

The cholesterol content is no bar to the explanation of the cyst as a simple one, because the cholesterol is only the result of decomposed desquamated epithelial cells which have been cast off into the interior of the cyst.

No abnormality in development is necessary if the cyst is explained as a simple mucous cyst, and this conclusion would seem to be the logical outcome of the examination of this interesting specimen.

Summary.

1. This paper has arisen out of the study of a naso-pharyngeal cyst.

2. A brief introduction precedes the recording of the clinical history.

3. The differential diagnosis is discussed and a pre-operative diagnosis was made of either a vestigial remnant cyst or a simple cyst arising in a mucous gland.

4. The operative findings and the macroscopic and microscopic pathological findings are described.

5. In the discussion the points for and against the two hypotheses mentioned above are weighed. The decision is finally given for a simple cyst.

Acknowledgements.

I am indebted to Professor MacCallum and Dr. E. S. J. King for much helpful advice in the preparation of this paper.

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AN UNUSUAL CASE OF PAPILLOMA OF THE BLADDER.

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Clinical Record.

C.T., aged forty-seven years, a stableman, was admitted to the Adelaide Hospital on February 10, 1938, with a history of having been hit in the crutch by a horse's head two days previously. Since that time he had continuously passed almost pure blood every time he micturated. There had been no dripping of blood apart from micturition; he had had some difficulty of micturition, but no frequency or pain. His own medical attendant had passed a catheter and had emptied his bladder of blood-stained urine. He had no previous history of hæmaturia or of any other illness of note, and he regarded himself as a perfectly healthy man.

On examination he was found to have a pulse rate of 100 per minute. He was pale; blood was oozing from his external urethral meatus and the urine contained frank blood. A catheter was passed and 230 cubic centimetres (eight ounces) of sterile boracic solution were run into the bladder; the same amount was recovered afterwards, so that the possibility of the bladder's having been ruptured was discounted. Exploration of the bladder was decided on, and with the patient under spinal anæsthesia I performed a suprapubic cystotomy. A large solid papilloma, the size of an apple, with a broad base, was found in the bladder, which was quite full of blood clot. The papilloma was removed by diathermy, the base was fulgurated, and a suprapubic drainage tube was inserted.

The post-operative course was slightly stormy. The patient developed staphylococcal cystitis, which gradually cleared up; and thirteen days after operation, although no further bleeding had taken place, he still had a hæmoglobin value of 50%. He was discharged, well, twenty-eight days after the operation, with instructions to report back for further cystoscopic examination. This, however, he has not done, so presumably he has remained well during the twelve months that have elapsed. The histo-pathological examination showed that the tumour was a papilliform carcinoma.

Discussion.

The case is reported on account of the unusual history of profuse hæmorrhage, apparently caused by a bump in the perineum, from an extremely large, solid, non-infiltrating, previously entirely symptomless papilliform carcinoma of the bladder.

Reviews.

NERVOUS DISEASE AND ITS DIAGNOSIS.

THE present edition of "The Diagnosis of Nervous Diseases" appeared in 1937;[1] it is the eighth, the first edition having been published in 1906.

The author, Sir James Purves-Stewart, whose name and fame are probably as widely known in the world of medicine as those of any other living neurologist, is to be congratulated not only upon being the author of such a fine book, but upon having lived to see it serve an exceedingly useful purpose for thirty-two years and throughout the various editions display a vigorous growth, having assimilated as much of the advances in neurology as was humanly possible.

It is almost impossible to praise this edition too much, and any criticism is offered with a proper appreciation of the difficulty of making an accurate survey in a work such as this, running into 800 pages of clinical exposition of the disorders of the nervous system.

In a review by THE MEDICAL JOURNAL OF AUSTRALIA of the seventh edition of this book some six years ago, it was pointed out that the author had failed to notice that the theory of the sympathetic innervation of muscles as expounded by Hunter and Royle had been proved by Wilkinson to be erroneous. In the present edition the author acknowledges this mistake (*vide* footnote, page 9). A further point also was mentioned that precocious sexual development was not only due to disorders of the pineal gland, but also to cerebral tumour. This correction has also been noted.

The book is divided into twenty-seven chapters, dealing, as in former editions, with the various subjective and objective manifestations of neurological disorders under titles such as "Pain", "Trophic Neurosis", "Reflexes" *et cætera*. There can be no doubt that this is quite the best method of presentation of the vast amount of knowledge relating to the clinical examination of the nervous system. As the work is essentially one for reference, this arrangement saves time and brings out more clearly the points of differential diagnosis. From this aspect the book has no superior.

The first two chapters are devoted to the anatomy and physiology of the nervous system, and they are probably the best in the whole book—the reader is given a clear and concise account of the basic facts, and the diagrams displayed are as simple as possible.

The author is especially to be congratulated upon insisting that the brain works as a whole; this very important fact could possibly be made more convincing if in future editions some account of comparative anatomy could be included.

The third chapter, that on case taking, could, we think, be considerably shortened by omission of the details of the various intelligence tests, for these are of little use unless they are in the hands of those who specialize in this department.

The same can be said for the chapter on psychoneurosis and electrodiagnosis. The former of these runs into 88 pages, and while we would not deny the great importance of this subject, it is doubtful whether long explanations of the mechanisms of psychological phenomena and of the ideas of the various schools of psychological thought are necessary or wise. In this field of knowledge the author is not a specialist and therefore cannot give an explanation of mental mechanism that is adequate or satisfactory. Indeed in a work such as this it is superfluous to make the attempt.

The chapter on electrodiagnosis is apt to give too simple a view of the results of electrical testing. It is our view that electrodiagnosis is very seldom required, that it is for several reasons often very difficult to perform satisfactorily, and also that it is often difficult to evaluate the results. The employment of condenser discharges to some extent is an advance on other forms of electrical testing, but it also has its difficulties. The paragraph dealing with nystagmus states that it is "an involuntary rhythmic tremor of the eyeballs generally bilateral and symmetrical". The author does not state whether nystagmus can occur in one eye alone. We have observed this phenomenon, although it is denied by some neurologists. On page 365 it is stated (in reference to the grasp reflex) that it is always pathological and due to a lesion of the normal transcortical inhibitory tract. This is not strictly correct, for we have observed this grasp reflex well developed in a patient with depression and hysterical conversion symptoms, the reflex disappearing completely in a few days when the patient recovered. It must be noted that this patient had consumed considerable quantities of barbitone, and this drug is apt to produce some symptoms that are generally due to organic disease.

The above criticisms are for the most part of minor importance and in no way impair the very great value of this work. It is one of the really few books that are indispensable both to the busy general practitioner and to the neurologist.

It will always rank as one of the highlights of medical literature.

[1] "The Diagnosis of Nervous Diseases", by Sir James Purves-Stewart, K.C.M.G., C.B., M.D., F.R.C.P.; Eighth Edition; 1937. London: Edward Arnold and Company. Demy 8vo, pp. 850. Price: 35s. net.

THE STORY OF ANÆSTHESIA.

THE story of anæsthesia has been often told, but rarely with the colourfulness and documentary detail of Dr. Fülöp-Miller.[1] Professor Waters, of Madison, once remarked of anæsthesia that never was scientific discovery ushered into the world in such an unscientific way. Born in casual experimentation, anæsthesia had to pass through the ether frolic and the popular lecture-room before it entered the operating theatre, from which its way ran through the patent office and the law courts, and through bitter public controversy before it attained the belated dignity of proper scientific investigation. This is the story which Dr. Fülöp-Miller sets out to tell.

After an introductory chapter on the history of human pain, the author describes attempts at its alleviation by Shamanism, by crude drug treatment and by suggestion. He proceeds to describe mesmerism; to tell of the early work on anæsthetics of Davy, Faraday and Hickman, and of the discovery of morphine by Sertürner. He introduces the itinerant lecturers and ether "frolickers" of the early nineteenth century, and shows how they inspired the serious clinical investigation of anæsthesia by Wells, Long and Morton.

The triumphant demonstration of ether anæsthesia by Morton in Boston in 1846 is the dramatic climax of the book, and ushers in an account of the sordid struggle for priority between Long, Morton, Jackson and the supporters of the deceased Wells. No less fully does the author describe the attempted commercialization of the discovery, which tarnished Morton's reputation as a scientific man.

Dr. Fülöp-Miller goes on to trace the development of chloroform by Liebig, Dumas and in particular by Simpson; he tells of its introduction into midwifery and the absurd bigotry which opposed it. He tells of the progressive evaluation of the toxicity of anæsthetics, from the days of Snow to those of the Hyderabad Commission, and subsequently to modern times. He discusses the

[1] "Triumph Over Pain: The Story of Anæsthesia", by R. Fülöp-Miller, translated by E. and C. Paul; 1938. London: Hamish Hamilton; Australia: Angus and Robertson Limited. Medium 8vo, pp. 438, with illustrations.

undesirable aspects of sedative and narcotic drugs; their toxicity and the problem of addiction to them. He traces the introduction of the numerous anæsthetics—inhalational, intravenous, rectal and regional—employed at the present day. In his final chapter he discusses the philosophy of pain, refuting the contention of its "biological necessity" and analysing the arguments for and against euthanasia.

The compression of a field so enormous into the scope of a single volume necessitates a certain sketchiness in the later chapters, although few prominent names or major facts escape passing recognition. From the sections which deal with current anæsthetic practice we would infer that Dr. Fülöp-Miller is not himself a practising anæsthetist. His style is possibly rather too journalistic for the medical reader, although this fault may be a virtue in the vivid presentation of a picture to the layman. His translators have served him brilliantly. The book has been adversely criticized by presumably well-informed critics, on the grounds that it does less than justice to the memory of the ill-fated Wells, the pioneer of nitrous oxide anæsthesia. Having no access to the original documents, we are unable to express any opinion on this point.

There is in the early history of anæsthesia something suggestive of a tragedy from the Greek. The author of the "Libation Bearers" would have appreciated the brooding doom which overhung the three protagonists, Morton, Wells and Jackson, those gifted, passionate, all too human men whose share in a great discovery was fraught with tragedy for each of them. Dr. Fülöp-Miller has a strange and moving tale to tell, and he tells it in a way which loses nothing of its poignancy.

CHEMOTHERAPY.

A SECOND edition of Findlay's "Recent Advances in Chemotherapy" has been published.[1] The first edition was issued in 1930. C. M. Wenyon, in a foreword, remarked that the work of Ehrlich and those immediately following him opened up fields of investigation in which empiricism became replaced by endeavours to correlate the specific actions of drugs upon parasites with chemical constitution. Investigators have noted that by varying the constitution of drugs their action may be increased or lessened or left unaltered. Findlay states that an attempt has been made to describe the more important advances in chemotherapy since the Great War. He considers that the eight years which have passed since the first edition have seen discoveries equal to if not more important than the original introduction of arsphenamine by Ehrlich. He states that in the sulphonamide drugs chemotherapeutic agents have been discovered which are revolutionizing the treatment of acute bacterial infections. He further states that "Atebrin" has gained an important place in the chemotherapy of malaria and that new trypanocidal compounds have been elaborated, while much has been learned of importance regarding the action of drugs in sleeping sickness. The various chapters deal with the chemotherapy of helminthic infections (ankylostomiasis and schistosomiasis), amœbiasis, leishmaniasis, malaria and blackwater fever, trypanosomiasis, syphilis, tuberculosis, leprosy and acute bacterial infections, including streptococcal, pneumococcal, meningococcal, gonococcal, staphylococcal, *Brucella* infections and those due to *Bacterium coli*. Finally the chemotherapy of virus infections is considered. Amongst the many excellent chapters mention might be made of the observations concerning "Fouadin" (a complicated antimony compound), "Gavano" (which is probably cephaëline or a derivative of it, although the composition has not been disclosed), and "Kurchi", which contains conessine and other alkaloids, which are considered to be of value in amœbic dysentery. Excellent accounts are given of drug resistance, chemotherapeutic interference, and synergic action. Findlay states that "Prontosil" and sulphanilamide exert some curative action on staphylococcal infections in mice, but they have not so pronounced an effect as in streptococcal infections. Favourable results have also been recorded in actinomycosis from sulphanilamide. Findlay emphasizes the warning that agranulocytosis is the most serious complication arising from these drugs, and death has followed such medication in a number of instances.

One is glad to note in this work the employment of the term "quinquevalent" in place of the hybrid "pentavalent". Findlay, however, is not on sound ground in using the term "tervalent". "Trivalent", to correspond with "quinquevalent" is etymologically preferable.

A complete index of authors and a subject index conclude this excellent volume.

[1] "Recent Advances in Chemotherapy", by G. M. Findlay, C.B.E., M.D., D.Sc., with a foreword by C. M. Wenyon, C.M.G., C.B.E., M.B., B.S., F.R.S.; Second Edition; 1939. London: J. and A. Churchill Limited. Large crown 8vo, pp. 533. Price: 21s. net.

THE MEDICAL PRACTITIONER AND WAR.

"THE DOCTOR'S VIEW OF WAR", edited by H. Joules, is a small book written by nine medical men and embodying the advice of many others, both the experienced and neophytes.[1] Though its motif is the somewhat Utopian desire of the abolition of war, its principles are not unduly obtruded, most of its chapters being singularly readable and instructive on many matters related to the medical aspect of war. Its foreword, however, puts forward the naïve statement that the medical profession could put a stop to war. It traces the doctor's role in past wars and the special responsibilities that he is likely to carry in the future, contrasting the past tendency towards international humanitarianism with the growing feeling of prejudiced national fervour. In tracing the history and evolution of the present-day system of medical care on the battlefield, it presents instances of disregard of their solemn undertakings under the Geneva and Hague Conventions by the Italians and Japanese, and combats the oft-expressed belief that wars have a beneficial effect on a race, though it admits that there may have been a beneficial effect in past wars.

The characteristics of war as they affect the doctor are described and a great deal of information is given in simple form as to the history of epidemics and the effect in the past of war in spreading them among the inhabitants of the combatant and neighbouring countries, as well as of the diseases of war in the armies engaged. Many details of the Great War are given, including sickness and mortality rates, with accounts of the causation and control of individual diseases. An interesting observation is that major infections accounted for only 27·5 of the 533 sick in each thousand of troops in the Great War. It describes in non-technical terms the effects of famine on the civil population, and gives a good epitome of deficiency diseases as well as an understandable presentation of the phenomena of shell-shock.

We find difficulty in agreeing with the thesis that "attack on the civil population . . . will form the major strategy of aerial warfare", and that while doctors should take a full share in drawing up plans for war there shall be no compulsion on them in the implementing of these plans. We feel sure that few of the medical profession in the British Empire will sympathize with the expression of a desire to free the doctors from any collective share in the defence of the State, with a belittlement of patriotism, and with the replacement of both by the right of individual action in accordance with personal comfort.

[1] "The Doctor's View of War", edited by H. Joules, M.D., M.R.C.P., with a foreword by J. A. Ryle, M.A., F.R.C.P.; 1938. London: George Allen and Unwin Limited. Crown 8vo, pp. 192. Price: 3s. 6d. net.

The Medical Journal of Australia

SATURDAY, MAY 20, 1939.

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CIVILIZATION AND THE PSYCHOSES.

THERE can be little doubt but that civilization, on account of its increasing complexity, is making progressively heavier demands on its bearers—demands which in many cases cannot be satisfactorily met—and that in consequence mental disorders are increasing. Though the ætiology of mental disorder is not fully understood, it is obvious that while man remains the serf of circumstances the origin of his mental troubles must lie deeply rooted in the social structure. Race, social status, urbanization and economic background are factors which play their part together with hereditary tainting and intrapsychic conflicts in the creation of mental maladies. It is pertinent, therefore, to inquire to what extent the huge changes recently wrought in the social setting may have strained man's powers of adaptation to the collective detriment of his sanity.

The subject is a difficult one and is fraught with confusion, despite the progress made by psychiatry in this present century. Figures are apt to be misleading and inferences misplaced. Facts conjured from statistics may be conscripted to the proof of quite erroneous conclusions. No agreement yet exists between scientists as to the relative roles played by heredity and environment in the development of psychotic states. There are some who believe that heredity holds the key to the mystery of mental disorder and who see in sterilization the only panacea for the mental infirmities of mankind. There are others who believe that the price we pay for our civilization is too high. They see in the speed, complexity and competition which characterize the present industrial era, in overcrowded and insanitary dwellings, in the rush and anxiety of work and the artificial narcotics of pleasure, nothing but jangled nerves, morbid inhibitions and corroding conflicts which breed madness and neuroses in our midst. Somewhere between these two viewpoints the truth may lie. At present it is obscured, partly by biologic ignorance and partly by current misconceptions spread by those journalistic Jeremiahs whose lurid pens have distorted facts in order to startle us from our complacency, and again by those whose political bias has held them captive to false ideals. There are many who, in looking at this problem, find it more comfortable to stigmatize the fertility of the unfit for the continual increase of mental disorders than to frame an indictment of the present social system. And yet it is difficult to account for the absolute increase in certain forms of mental disorder without our invoking those ætiological factors which have their genesis in some of the worst aspects of our democratic life.

To say that more than half the hospital beds in any civilized country are occupied by patients suffering from nervous and mental diseases would not be an exaggeration of the present position. And patients suffering from schizophrenia, a mental disorder twice as prevalent as tuberculosis, occupy the larger proportion of these beds. Schizophrenia takes its toll among the young when life's enchanted cup is first lifted to their lips; and its incidence in civilized communities is steadily rising. The most striking increase in mental disorder, however, belongs to cerebral arteriosclerosis, for which statistics show a 536% increase within the last quarter of a century.

Admittedly there are wide gaps in our knowledge concerning the ætiology of both cerebral arteriosclerosis and schizophrenia. The former is sometimes so closely associated with senile dementia that it is difficult to know just where the arteriosclerosis ends and the senile changes begin; and the latter is a waste-paper basket term which includes a variety of psychotic states held together by no accepted common pathological bond. The one occurs characteristically at the onset of maturity; the other belongs to the later decades, when life's storm and stress should be yielding to the serenity and ripeness of advancing age. Neither in their symptoms nor in their clinical course have these psychoses anything in common; yet the conviction is growing that both represent reactions to the burden imposed by contemporary civilization. How else indeed may one explain the tremendous increase within the last twenty-five years of cerebral arteriosclerosis except by implicating the stress and strain of competitive conditions and the privations, irritations, worries and frustrations incidental to the fevered scramble of twentieth century life? The span of life has been prolonged; but this comes as a doubtful blessing to those who, perhaps for half a century, have battled against poverty and unemployment and have been worn down by the dread of destitution in old age.

Medical science may one day be able to express in terms of chemistry the part which anxiety plays in the alteration of the internal secretions to the detriment of nervous tissue. Until then we must rest content with the inference that prolonged states of anxiety play a major part in the production of cerebral arteriosclerosis. That anxiety plays a part in the ætiology of schizophrenia has lately been recognized; for not only may anxiety arise from the "castration complex" described by Freud as the outcome of the family situation, but it may also be produced by that feeling of insecurity imposed by adverse economic conditions during babyhood, preventing the development of ego-function and thereby setting up the tendency to shun reality, which is the chief characteristic of the psychoses. Other factors undoubtedly operate in the production of schizophrenia. But once the tendency to retreat has been implanted in the child, one can see how inevitable must be the later development of schizophrenia in the young adult faced with all the sordid crudity of industrial exploitation in the modern world.

Man is a social animal and cannot be separated from his social setting. Nor can the mental disorders which prey upon him be viewed in proper perspective and understood unless seen as in relation to the environment which helped to produce them. These disorders are increasing because certain factors in our civilization are inimical to mental health. It is within our power to recognize and deal with these factors so that the scourge of mental disorder may be ameliorated. To what extent this may be done depends upon our collective desire and ability to destroy the rotten elements in our social structure and find a new way of life.

Current Comment.

ANGINAL SYNDROME DUE TO HYPOTHYREOIDISM.

"IT does not appear to be generally recognized that typical symptoms of *angina pectoris* (including angina of effort) may be due to hypothyroidism and can then be relieved by thyroid extract". So begins a description by G. E. Beaumont and J. D. Robertson of a patient exhibiting these phenomena.[1] The patient was a clerk, aged forty-four years, who for six years had suffered from classical angina of effort, but in whom no physical, radiographic or cardiographic signs of organic heart disease were detectable. His habits were temperate and his blood pressure was not elevated. His appearance was that of normal health and in no particular suggestive of myxœdema. Investigation after his admission to hospital, however, showed a reading of his basal metabolic rate, according to the Aub and Du Bois standard, of −33%. No anæmia was discovered by a blood count. The bodily temperature was subnormal. The authors administered an initial daily dose of thyreoid extract, amounting to four grains, which was followed by immediate improvement. Thereafter the dose was reduced and the patient was kept under observation for two years. The relationship of falls in the basal metabolic rate to the recurrence of cardiac pain was recognized. The dose of thyreoid extract was raised as seemed desirable, but rarely exceeded one grain a day. The patient's weight and blood pressure altered very little during the treatment. Curiously enough, after

[1] *The Lancet*, March 25, 1939.

approximately two months of thyreoid medication, the electrocardiogram transitorily showed pronounced *QIII–TIII* inversion, reminiscent of ischæmic changes in the myocardium. The authors attributed this to coronary spasm.

That the state of myxœdema profoundly affects the cardiac musculature has been recognized since Ord's description of the syndrome in 1880. Dyspnœa, cardiac dilatation, and flattening of all *T* waves in the electrocardiogram are prominent features. Cardiac pain, while by no means rare, is distinctly less common. It is therefore unlikely that minor grades of thyreoid deficiency would produce pain as the presenting symptom. The only premises for the diagnosis of myxœdema in the patient above described were a depression of the basal metabolic rate and a return of pain when after rising it fell towards its initial low level. No other clinical features of myxœdema were present. Absolute reliance upon the breathing test is probably unwise in hypothyreoidism as in hyperthyreoidism. Angina of effort may occur in the thyreotoxic state. Total thyreoidectomy is said to relieve cardiac pain, though nerve destruction may be partly responsible for this relief. Hence it would be unwise to base any final convictions upon the case report of Beaumont and Robertson. Their experiment should be repeated upon a number of patients, and those should be selected who after appropriate laboratory and clinical investigation are found to resemble most closely the individual described.

ANOREXIA NERVOSA.

CONSIDERABLE attention has been recently paid to that rather inadequately named condition *anorexia nervosa*. Perhaps the stimulus of research on the endocrines has been responsible for this, for resemblances of the malady to pituitary cachexia are considerable, and the question has been raised whether it may not actually be a disorder of endocrine origin. In fact case histories have been published in which the diagnosis made by a physician specially experienced in endocrine disease was Simmonds's disease, while another physician, whose field lay in the realm of psychological medicine, considered it to be *anorexia nervosa*.

Simmonds first wrote a clear description of that remarkable clinical state in which a destructive lesion of the anterior lobe of the hypophysis causes a profound depression of body metabolism with emaciation, the appearance of disproportionate senility, and such serious disturbance of visceral functions that death usually results. But Simmonds's cases were reconstructions from actually observed autopsy findings, whereas the diagnosis during life may be unconfirmed by such convincing evidence. H. B. Richardson, in an article on these two conditions, points out that the uncertainty of diagnosis depends on the fact that most of the symptoms seen in true Simmonds's disease may be reproduced by simple inanition.[1]

That astute observer Sir William Gull, in his accurate description of *anorexia nervosa*, as he called it in 1874, placed on record some observations whose point and force are recognized to this day, in particular the striking degree of activity shown by patients with this disorder, their curious psychical behaviour, and the usually good prognosis — features not suggesting severe organic disease. Ryle's recent contribution to the same subject is also a valuable exposition. Richardson is, however, specially interested in the possibility of some connexion between less serious types of Simmonds's cachexia and *anorexia nervosa*. The possibility of such connexion has occurred to many people who have studied the disease, and it is not only the professional observer who thinks of the internal glands in *anorexia nervosa*, for it often happens that the young female sufferer is brought under medical supervision not merely because she will not eat and vomits, but because she has amenorrhœa. Richardson has thoroughly studied six cases. All the patients were women. Elaborate metabolic and chemical studies were carried out, and particular attention was paid to their psychological condition. One patient died in a state of extreme emaciation, the terminal lesion being an acute pyelonephritis; the others made good recoveries. The interesting thing about the records of these patients is that the histories fit more or less exactly into the standard description of Simmonds's disease, yet the conclusion finally reached was that any endocrine disturbance was purely secondary and that the prime cause of the illness was psychic. They in fact provided excellent examples of one variety of psychosomatic disease.

In one case anterior pituitary extract was administered by injection, and it appeared as if this had some favourable effect on the patient's state; yet subsequent review of this case cast great doubt on the truth of this conclusion. In the second case improvement seemed again to follow the use of anterior pituitary extract after a considerable latent period, but when a *placebo* was substituted the patient continued to improve just as steadily as before. The third case was that of a girl of sixteen years. Though there was a definite abnormality in her mental state, taking the form of an immature reactiveness to her environment, a psychiatrist did not consider this factor strikingly relevant. In the later stages of her illness she appeared to suffer from adrenal insufficiency in addition to the other symptoms, which strongly suggested Simmonds's cachexia; but this proved to be incorrect. She died of pyelonephritis with multiple thrombosis, and in spite of the suggestive history no pituitary lesion was discovered. The remaining patients presented similar pictures, though of less severity, and were successfully treated by general measures without special medication. One of these patients was of

[1] *Archives of Internal Medicine*, January, 1939.

special interest because thyreoid substance was administered for a time with a harmful effect, considerable weight being lost.

It is most instructive to review this series. All the patients might well have been presented as illustrations of varying grades of Simmonds's disease, yet it may be said with confidence that the correct diagnosis was *anorexia nervosa*. Those who meet with emaciated patients with more or less profound metabolic concomitant effects will be wise to remember that proved Simmonds's disease is very uncommon. *Anorexia nervosa*, on the other hand, is not very uncommon, and its prompt recognition should lead to an equally prompt assessment of the neurotic elements in the patient's life and history. Even laboratory findings, such as low basal metabolic rates, flat blood sugar curves, and clinical data, such as emaciation and moderate bradycardia, will not justify a "spot" diagnosis of Simmonds's disease. Even the illusion involved in the apparent success of endocrine therapy should be discounted, as the first and second cases in this series show. Naturally the first duty of a physician in such cases is to try to satisfy himself that no organic lesion is certainly present; but he must not so swing to the more mechanistic outlook on medicine as to fail to evaluate the nervous factors in this disease, which is so curious in type and so difficult and tardy of cure. The battle is probably partly won when it is realized that the malady is one of the spirit.

THE STERNAL MARROW OF CHILDREN.

P. VOGEL AND F. A. BASSEN have communicated the results of a study of the sternal marrow of children in normal and pathological conditions.[1] They point out that the first recorded investigations of the subject were those of G. Ghedini in 1908. The tibia was first used as the site of material for biopsy; but C. Seyfarth, in 1923, selected the sternum in its place, as the tibia was not suitable for older children and adults. The technique used by both these investigators, however, necessitated a surgical procedure, and in 1927 M. I. Arinkin introduced a simple method of aspiration to obtain sternal marrow. Aspiration presents obvious advantages over the surgical method for the removal of the marrow of infants and children for biopsy. In this age group the sternal plate is very thin—a fact which renders operative measures undesirable. The insertion of a needle is easily managed. The present study was to make and to report observations on a group of normal infants and children and on an unselected group with blood dyscrasias and other abnormalities. Vogel and Bassen remark that marrow smears well stained with the Jenner-Giemsa method usually present the appearances of leuchæmic blood. The hæmatic marrow cells are numerous, and 500 or 1,000 of them are readily counted. Occasionally fixed cells, for instance reticular and endothelial cells, are observed. Most of the cells may be included in the following groups: myeloblasts and their derivatives, lymphocytes, plasma cells, hæmatogones, reticulum cells, megakaryocytes, Gaucher cells, normal and nucleated red cells and neoplastic cells. Vogel and Bassen consider that hæmatogones are the mystery cells of the bone marrow. They have been deemed to be undifferentiated primordial cells or hæmocytoblasts or micromyeloblasts. The cells are smaller than leucocytes. Each has a dense nucleus composed of dense chromatin masses. Cytoplasm is practically absent; occasionally a thin blue rim is observed. In supravital preparations they appear as small nuclear masses with little distinct cytoplasm. In the cytoplasm neither mitochondria granules nor vacuoles are seen. Vogel and Bassen observed no forms indicating transition from these cells to myeloid cells. The significance of these cells is quite unknown.

In this study by Vogel and Bassen most of the subjects selected for investigation of normal marrow were admitted to hospital for tonsillectomy, and showed no evidence of any other disease process. The remainder of the series consisted of new-born infants. As stated by Vogel and Bassen, the criteria of normal bone marrow in infants and children have not yet been adequately determined. F. Tecilazic, using tibial marrow of normal new-born infants, observed a predominance of erythroid elements (70%) in the early days of life. During the second week this was prone to diminish to about 45%. From then onward the erythroid elements tend to lessen until about the age of two years the figures generally approach those of adults. The observations of Vogel and Bassen on 41 children disclosed considerable variations in individual cases. The total nucleated cell counts averaged between 300,000 and 400,000 per cubic millimetre, which is much in excess of the average count for adults (118,000); the number varied between 50,000 and over 1,000,000. It is emphasized, however, that the admixture of blood must be considered in the counting, as its dilution of the marrow substance will greatly diminish the result of the count. The total quantity of material aspirated should not exceed 0·2 cubic centimetre. Vogel and Bassen found in their normal group that the ratio of myeloid to erythroid cells was approximately 3:1. The myeloid cells showed marked variation in different cases. Lymphocytes varied from 1% to 25%. Hæmatogenes were sometimes absent, but in one apparently normal infant the proportion was 20%. Vogel and Bassen consider that any conclusions would be misleading on account of the great variation shown and the smallness of the group.

As regards the 72 subjects evincing pathological conditions, it was found that the marrow was typical in every case of acute leuchæmia. The acute lymphatic type was characterized by almost entire replacement of the normal cells with lymphoblasts and lymphocytes (over 95%). In the acute

[1] *American Journal of Diseases of Children*, February, 1939.

myeloid type replacement with myelocytes and myeloblasts occurred. In infective mononucleosis observations on the marrow disclosed no increase in lymphocytes. This observation was valuable in the exclusion of leuchæmia, particularly when the heterophile antibody reaction was absent. In seven cases of sickle-cell anæmia the marrow in all showed a considerable increase in normoblastic activity. Five cases of *erythroblastosis fœtalis* gave interesting findings. Two of the cases might have been classified as instances of *icterus gravis neonatorum*. In these the marrow exhibited an increase in the erythroid elements. In two other cases the condition might have been considered as anæmia of the new-born. In the remaining instance there was intense jaundice with an increase in the nucleated red cells, but no anæmia. Vogel and Bassen ask whether the variations in the data of this group can be accounted for by the difference in the production of red cells, by failure of production or by destruction, or whether they indicate different disease entities. In nutritional anæmia no increase in the activity of the normoblasts or erythroblasts was noted in any of the three cases. The lack of characteristic features was of value in excluding other blood dyscrasias.

In the series of cases here recorded most of the blood dyscrasias are included. In most of the cases diagnosis was made prior to the performance of aspiration. When doubt existed this measure often furnished valuable evidence in the establishment of a diagnosis. In other instances it enabled an entity to be excluded from the diagnosis. The observation of Gaucher cells when Gaucher's disease had not been considered was a striking instance of the diagnostic value of this examination. The acute leuchæmias were invariably associated with what Vogel and Bassen term "leuchæmic marrow", irrespective of the numbers of immature cells in the peripheral blood. Apart from the marrow of leuchæmia, Gaucher's disease and neuroblastoma there were no specimens which could be deemed diagnostic in themselves. Great normoblastic activity was invariably a feature of the sickle-cell anæmias and hæmolytic icterus, but was not in itself absolutely diagnostic. There was no case of Niemann-Pick disease in the series, but a footnote records one such diagnosed by sternal puncture. It is considered that kala-azar might also be diagnosed by this method, and in generalized carcinomatosis malignant cells may be found in the aspirated material. This contribution by Vogel and Bassen is of particular value.

UNSUCCESSFUL CHOLECYSTECTOMY.

A REPORT which should be of interest to both surgeons and general practitioners has been made by E. L. Eliason and J. P. North.[1] They have reviewed 264 cases in which cholecystectomy was performed and in which follow-up notes extending over a period of at least a year were available. Of the 264 patients, 28 suffered from residual symptoms. Twelve of these 28 may be dismissed from consideration, for seven of them had symptoms due to conditions outside the biliary tract which arose chiefly after operation, and five had biliary symptoms which disappeared on further treatment. In eight of the remaining 16 cases (referred to as Group I) no significant biliary lesion was found at operation; in other words, the preoperative diagnosis was incorrect. The other eight patients, comprising the authors' Group II, had lesions of the gall-bladder or its ducts, but their symptoms persisted despite removal of the gall-bladder. The authors are careful to explain that Group I does not include all cases in which a wrong diagnosis was made. The lesson to be learned from this group is that the importance of early symptoms may easily be overlooked. For example, one patient gave a history of nausea, vomiting and gaseous distension extending over four years. He had hunger pains after meals, had lost weight and suffered from two attacks of pain with jaundice. X ray examination revealed a non-functioning gall-bladder. Twenty-one months after his gall-bladder, thickened and containing a single stone, was removed, a large carcinoma of the stomach was discovered during the performance of a pelvic operation. The eight cases in the second group serve to emphasize again the fact that even when gall-stones are actually demonstrated it may not be right to attribute to them all the patient's digestive symptoms, since many gall-stones may be "silent". In theory this is well known; in practice it is easily forgotten. One example in this series is a case in which a preoperative diagnosis of peptic ulcer was made. At operation the surgeon searched in vain for a peptic ulcer and eventually removed a thickened gall-bladder with a stone in the cystic duct. The residual symptoms suggested that the original symptoms were due to phrenospasm and duodenal stasis, apparent on radiological examination.

[1] *Annals of Surgery*, April, 1939.

PATHOLOGICAL REPORTS FROM THE CHILDREN'S HOSPITAL, MELBOURNE.

IN last week's issue of this journal it was announced that the Committee of the Melbourne Pædiatric Society had sponsored the publication in book form of the twenty pathological reports by Dr. Reginald Webster which have appeared during recent months in this journal. This is a matter for congratulation. Dr. Webster's contributions will be of value to both clinicians and pathologists; they are written, moreover, in a style which enlivens what might in the hands of some authors be a dull subject. Those who wish to take advantage of this publication are invited to communicate with Dr. J. W. Grieve, the honorary secretary of the Melbourne Pædiatric Society, at 12, Collins Street, Melbourne, C.1. We hope that the applications will be numerous, for Dr. Webster may thus be encouraged to extend his interesting series.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

The Physiology of Human Hair.

C. H. DANFORTH (*Physiological Reviews*, January, 1939) observes that knowledge of the physiology of human hair is still very imperfect. Compared with those of mammals, the range of human hair forms is limited; but their rather extraordinary regional development suggests three roughly defined groups. These are the following: (i) hair that is the same in both sexes, (ii) hair that behaves as an ambosexual character, (iii) hair that serves as a true secondary sexual characteristic. Until quite recently there has been a tendency to ascribe differences between the sexes to the influence of endocrine factors. Actually, in this author's opinion, the structure of the individual follicle is more important than hormonal or constitutional influences. Two neighbouring follicles may behave quite differently, while those at some distance produce identical hairs. Occasional cases occur in which full thickness autoplastic skin grafts made in childhood ultimately develop, in an entirely new site, the type of hair appropriate to the region from which the graft was taken; this shows that the effect of the circulating hormones is in each case determined by some kind of selective action on the part of the follicle itself. Pronounced hereditary and racial differences may exist between homologous follicles of different individuals. In the author's opinion these differences (for instance, those between the facial hairs of Semitic and Mongolian subjects) are primarily in the constitution of the hair follicle and are not due to different endocrine levels, as was formerly suggested by Sir Arthur Keith. There is still no satisfactory information as to the relation of any of the endocrine glands to hair growth. There is an immense amount of clinical data, but in the author's opinion such data are not well controlled. One outstanding item is the association between tumours of the suprarenal cortex in children and precocious and extensive hair development. There is some evidence also in support of the old idea that testicular and ovarian secretions have opposite effects on the capillus, despite the fact that baldness and probably "thinning" of the hair in males are due in part to a sex-linked gene. The author proceeds to discuss the properties of the hair shaft itself, the variations in the shape of the cross-section, its relation to curling and twisting, and the utilization of this fact in the production of a "permanent wave". He mentions the fact that the supposed excretion of lead, antimony and arsenic by means of the hair has been questioned lately, the increased lead content of hair from painters having been shown to be due to contamination with lead dust. The chemical changes produced by a "permanent wave" are mentioned; when deformation occurs in the presence of steam, a reorganization of the molecule is effected, with a new spacing of the side-chains. The cyclic activity of the hair follicles is described. Since capillus hair grows at the rate of about 0·4 millimetre per day, and normally reaches a length of some 65·0 centimetres, it has been inferred that there is a period of continuous growth lasting about 1,600 days. It is probably rarely longer than this. The author regards as a pleasantry the implication of Griffith that if it were not for attrition and barbers the hair of elderly people would trail behind them for as much as 35 feet. The cycle of growth shows consistent regularity. The same follicle over a period of years will frequently show many cycles of almost precisely the same length. Attempts to modify this rhythmic growth by indirect means have met with very little success. The number of hair "restorers" or hair "stimulators" that have proved wholly ineffective is very great. It is the curious independence of individual hair follicles that makes their study of interest to the physiologist.

Stuttering.

STANLEY COBB AND EDWIN M. CLOE (*Physiological Reviews*, January, 1939) review the various theories of the cause of stuttering. They regard language as one of the most highly integrated functions of man; hence it is one of the most vulnerable, and speech disorders are common. Stuttering becomes an impediment of greater or lesser degree in about 1% of the adult population; many more pass through a period of stuttering in youth. In phylogeny a close relationship is evident between the development of binocular vision, manual skill, and finally a leading hand and a leading cerebral hemisphere. The authors discuss the term "dexterity". There is some evidence that rats are somewhat right-handed, and crabs appear to tend that way; but in man alone the term is definite, about 75% of men being right-handed and the remaining 25% left-handed or ambidextrous. The dominance of the left hemisphere in right-handed persons is pronounced but not absolute. The authors believe that stuttering in most cases is associated with variations in the dominance of the leading cerebral hemisphere, and that this in turn is associated with some as yet unrecognized structural variation in the brain. They emphasize their use of the term "variation", as they do not consider that these variations of dominance deserve the term "defect". They state that language disabilities are often familial in occurrence, and argue that if neurosis is defined as being a maladjustment—that is, environmental—then neurosis cannot be the sole cause of stuttering. Associated with stuttering and other language defects is a familial tendency to left-handedness. The hemisphere dominant in respect to the leading hand is usually dominant in respect to language. The result seems to be that a defect in dominance or a conflicting dominance is often associated with ambidexterity, motor awkwardness and some language difficulty. Hence in the treatment of stutterers exercises aimed at correction of weakness of cerebral dominance are employed, as well as speech therapy and psychological methods. Instances of stammerers who have become experts in the study and use of language are given.

Vaso-Constriction in the Hand from a Deep Inspiration.

MICHAEL G. MULINOS AND ISRAEL SHULMAN (*The American Journal of Physiology*, February, 1939) present data which lead to the conclusion that simple deep breathing results in constriction of the arterioles of the hand. Using normal human subjects, they have studied the vascular state of the hand by the following five methods: (i) the pressure plethysmograph method of Hewlett and Zwaluwenburg, which measures the rate of blood flow in the hand; (ii) the simple plethysmograph method, which measures the volume changes in the blood present in the hand during an experiment; (iii) the temperature of the skin; (iv) the skin calorimeter as an indication of the available heat of the skin; (v) the microscopic observation of the capillary tufts at the nail-bed, which reveals the condition of the minute vessels and the behaviour of the blood within them. By these methods the authors found that a deep inspiration caused vaso-constriction of the arterioles of the forearm and hand, especially pronounced in the skin of the fingers. They believe that the vaso-constriction from a deep breath is due to a reflex and is independent of the blood flow and blood pressure in the hand and of the temperature and moisture content of the inspired air. The constriction appeared to be exaggerated by any irritant or painful stimulus, such as pinching of the skin or inhalation of smelling salts or tobacco smoke, which may accompany or shortly follow the deep breath. The authors remark that the occurrence of vaso-constriction from a deep inspiration is of significance because of the voluminous literature on the relationship between cigarette smoking and vaso-constriction and the bearing of the latter on such pathological states as *thromboangiitis obliterans*. It has often been reported that cigarette smoking causes significant vaso-constriction only if inhalation is practised. The results recorded here seem to show that not the tobacco but the act of inhaling the smoke plays a major part in causing the ensuing vaso-constriction.

BIOLOGICAL CHEMISTRY.

Night Blindness caused by Dietary Deficiency.

GEORGE WALD, HAROLD JEGHERS AND JOSEPH ARMINIO (*The American Journal of Physiology*, September, 1938) describe the development and cure of night blindness in a human subject whose vitamin *A* intake was controlled. The earliest effect of a deficiency of vitamin *A* in the diet was noted within twenty-four hours. Within twenty-five days the threshold of the dark-adapted rods was raised to a level about fifty times as high as normal, and that of the dark-adapted cones became about four times as high as normal. The development of hemeralopia was repeatedly checked temporarily by the oral administration of vitamin *A* or carotene. Ingestion of either of these substances was followed by a latent period of about thirty minutes, during which time the hemeralopic threshold remained unchanged. At the end of this latent period the threshold rapidly became normal. In all the observations made the behaviour of the cones was similar to that of the rods, and the authors therefore suggest that vitamin *A* is a precursor of cone visual pigments as well as of the rhodopsin of the rods. The authors recommend that in clinical measurements of hemeralopia the preliminary light adaptation of the subject should be omitted and the threshold of the completely dark-adapted eye accepted as the most satisfactory hemeralopic standard.

Carbohydrate and Protein Metabolism.

D. P. CUTHBERTSON AND H. N. MUNRO (*The Biochemical Journal*, January, 1939) have studied the roles of total dietary carbohydate and of surfeit carbohydrate in the protein metabolism of human subjects. They observed the following phenomena: (i) the effect of complete separation, as regards time of ingestion, of the carbohydrate and protein of an adequate diet; (ii) the effect of separation of only part of the protein from the carbohydrate in such a diet; (iii) the effect of ingestion of surfeit carbohydrate at a different time from that of the ingestion of protein. When the carbohydrate and protein moieties were separately ingested a negative nitrogen balance occurred; about two grammes of nitrogen were lost daily, chiefly in the form of urea. In contradistinction to this, nitrogen equilibrium was maintained when a small fraction of the total protein intake was consumed at the same time as the carbohydrate, which thus showed a nitrogen-sparing effect. Further, when carbohydrate in excess of energy requirements was ingested over a sufficiently long period, storage of nitrogen occurred, irrespective of whether the carbohydrate and protein were ingested separately or together, the carbohydrate thus showing a nitrogen-saving effect. It is believed that the nitrogen-sparing and the nitrogen-saving effects have one underlying mechanism: that carbohydrate has a specific inhibitory effect on the deaminases of the body. The presence of carbohydrate along with the protein in the ordinary diet ensures that some of the amino-acids escape deamination and go to replace the effete products of endogenous metabolism; the nitrogen balance is thus maintained. When surfeit carbohydrate feeding is continued for several days the stores become charged, and the freshly ingested carbohydrate of the ordinary meals does not pass out of circulation with its wonted rapidity. Thus carbohydrate ingested separately from protein is available for the inhibition of deamination, and produces the same effect as surfeit carbohydrate taken at the same time as the protein.

Chemical Processes in Muscles.

M. DUBUISSON (*The Journal of Physiology*, January, 1939) has investigated the changes in reaction accompanying contraction of smooth and striated muscles. Owing to the rapidity of contraction of striated muscle, most of the work was performed with smooth muscle, although qualitatively the same changes were found in both types. Four successive changes in reaction were observed in the course of isometric contraction of smooth muscle. The first was an alkaline phase beginning before the contraction and reaching a maximum at the period of increasing tension. This phase must accompany an unknown chemical process. The second was an acid phase, which began before contraction and reached a maximum towards the middle of the period of rising tension and was proportional to the tension developed. This is probably an expression of the decomposition and resynthesis of adenyl pyrophosphoric acid. The third was an alkaline phase, which began during the period of rising tension and was maximal at the outset of relaxation. This represents the hydrolysis and synthesis of creatine—phosphoric acid. The fourth was an acid phase, which began during contraction and was maximal several minutes later. It is an expression of the formation of lactic acid.

Deafness Produced by Diet.

EDWARD MELLANBY (*The Journal of Physiology*, December, 1938) has made histological examinations of the labyrinth capsules of young dogs fed for some months with diets of natural foodstuffs deficient in vitamin *A* but rich in cereals. He observed degeneration of different degrees up to complete disappearance of the cochlear nerve, the cells of the spiral ganglion and their central and peripheral branches; degeneration to a lesser degree of the vestibular branch of the eighth nerve, and overgrowth of bone in the modiolus and of the periosteal layer of the capsule near the brain. The overgrowth of bone was apparently responsible for the degenerative changes in the nerves by reason of the pressing and stretching of these tissues. Serous labyrinthitis also developed in the cochlea, and this appeared to produce degeneration of the sensory epithelium of the labyrinth, including that of the organ of Corti and of the ampullæ of the semicircular canals. Examination of the base of the skull revealed other bone overgrowth and deformity, which were probably responsible for the degenerative changes in other cranial nerves, such as the optic and trigeminal nerves previously described as resulting from vitamin *A* deficiency.

Acute Riboflavine Deficiency.

H. R. STREET AND G. R. COWGILL (*The American Journal of Physiology*, February, 1939) record the effects of feeding to dogs a diet deficient in riboflavine but adequate in other respects. In the early stages a decrease in appetite and a steady decline in body weight occurred. After several months the dogs were found to collapse in a characteristic manner. The animals recovered promptly after injection of small amounts of crystalline riboflavine. During an acute attack the body temperature and respiratory rate fell considerably, and electrocardiograph records showed an inversion of the *T* wave. Since riboflavine is a component of Warburg's yellow enzyme, which itself is a component of an oxidation-reduction system, it is believed that the fall in respiratory rate and body temperature results from a decrease in metabolic rate occasioned by a deficiency of the yellow enzyme. A daily supplement of 25 microgrammes of riboflavine per kilogram of body weight was found to maintain dogs in health for an extended period.

Gastric Secretion in Alcoholics.

W. B. SEYMOUR, T. D. SPIES AND W. PAYNE (*The Journal of Clinical Investigation*, January, 1939) have studied the gastric secretion in 40 chronic alcohol addicts, in whom there was no clinical evidence of vitamin deficiency or anæmia. Histamine was used as a secretory stimulant. The results showed a diminution in the volume of gastric juice secreted, a diminution in acidity and increased evidence of achlorhydria; but the peptic activity of the gastric juice was apparently unimpaired. A single gastric analysis was not sufficient to determine true achlorhydria, since a second analysis following histamine in some cases demonstrated free acid where none was previously found. The incidence of achlorhydria in this group of patients with uncomplicated alcoholism was lower than in other recorded studies in which alcoholism was complicated by polyneuritis.

British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the Western Australian Branch of the British Medical Association was held at the Hospital for the Insane, Claremont, on March 26, 1939, DR. L. A. HAYWARD, the President, in the chair.

Financial Statements.

The honorary treasurer submitted his annual report and balance sheet of the general account, the investment funds account, and the medico-political account, together with the auditor's report. These were adopted. The statements are published herewith.

Dr. T. C. Boyd and Dr. A. W. Farmer were elected honorary auditors.

Annual Report of Council.

Dr. L. A. Hayward read the annual report of the council. The report is as follows.

I have pleasure in presenting the report of council for the year ending March, 1939.

The membership of the Branch has increased from 286 to 300.

It is with great regret that I have to report that four members died during the year: Dr. C. H. Bennett, of West Perth; Dr. F. T. Lovegrove, of Claremont; Dr. D. J. McRae, of Geraldton; Dr. H. O. Irwin, of Boulder.

General Meetings.

Twelve meetings were held during the year, with an average attendance of 53.

The annual general meeting was again held by the kind invitation of Dr. James Bentley at the Hospital for Insane, Claremont. Clinical meetings were held at Perth and Fremantle Hospitals by kind arrangement of the superintendents of these hospitals, both of which were much appreciated by members. Also a very successful general meeting was held at Bunbury, arranged by the South West Districts Medical Association, followed by a dinner attended by members and their wives. At this meeting papers were read by Dr. M. F. Williams and Dr. A. A. Merritt. During the year interesting papers were read by Dr. V. H. Webster, Dr. A. P. Davis, Dr. H. C. Callagher, and during post-graduate week by Dr. C. H. Fitts and Mr. Charles Osborne. At nearly all general meetings national health insurance was prominent in the discussions, and there were two extraordinary meetings held on this matter.

A successful dinner this year was held at the Palace Hotel at the close of post-graduate week, there being present 55 members and 6 guests.

Council.

Your council held 19 meetings, members attending as follows:

Dr. Atkinson	4	Dr. M. K. Moss	18
Dr. Ainslie	18	Dr. D. Smith	9
Dr. Carter	18	Dr. Stewart	16
Dr. Cuthbert	17	Federal representatives (by invitation):	
Dr. F. Gill	11	Dr. McWhae	2
Dr. Hayward	19	Dr. Paton	11
Dr. Le Souef	19		

In addition to these council meetings there were 19 meetings of the special National Health Insurance Subcommittee which included the council.

There were various meetings of other subcommittees. The main items are as follows.

Federal Council.

Dr. Paton and Dr. Carter were appointed Federal representatives for 1939, but owing to the resignation of Dr. Paton, Dr. Le Souef was appointed on the Federal Council in his place. It affords me great pleasure to add that Dr. Le Souef was appointed by Federal Council last week to represent the British Medical Association of Australia at the annual general meeting of the British Medical Association in Aberdeen this year.

The Federal Council and its National Health Insurance Subcommittee has met five times during the year, as follows:

June: Attended by Dr. Paton, Dr. Carter and Dr. Aberdeen, Dr. Aberdeen being general practitioners' representative.

July: Attended by Dr. Carter, Dr. Hayward and Dr. Aberdeen, Dr. Aberdeen being general practitioners' representative.

August: Attended by Dr. Carter and Dr. Hayward (as substitutes for Dr. Paton and Dr. McWhae), Dr. Aberdeen being general practitioners' representative.

November: Attended by Dr. Carter and Dr. Hayward, Dr. Aberdeen being general practitioners' representative.

March: Attended by Dr. Carter and Dr. Hayward, Dr. Aberdeen being general practitioners' representative.

At the meeting of the Federal Council held in December the Branch was represented by Dr. Paton and Dr. Cuthbert.

I would like to stress the very valuable work that Dr. Paton has done as member of the Federal Council. He has represented this State since 1925—fourteen years—and has done very excellent work, and I would like this placed on record. A very hearty vote of appreciation of his services was passed by Federal Council last week.

National Health Insurance.

This demanded an enormous amount of work by your council, the general practitioners' representatives and country districts associations.

At the instigation of your council the Federal Council agreed to appoint a National Health Insurance Subcommittee through whom all national insurance business must pass. Before this was agreed to your council's recommendations were telegraphed to every Branch council. As a result a general practitioners' representative was appointed from each State. This was the first step towards consolidating the profession, which was on the verge of disintegration as a result of the Federal Council's negotiations in May with the Commonwealth Government, because although the Federal Council stipulated to the Government then that the terms agreed upon must be first ratified by the Branches, these terms were used by the Government to indicate the terms of the profession; then followed the Government's charge of repudiation by the Federal Council. This attitude of the Government toward the British Medical Association has been changed by the existence of the Federal National Health Insurance Committee. Your council appointed an economist from the university, who was able to show that the original figures supplied to the Federal Government by the Commonwealth were not correct. Elaborate returns were prepared from *questionnaires*, lodge returns and mines' wages sheets, which all indicated that the family unit was 2·5, not 3·2. The mines' wages sheets showed that a large number of miners were in receipt of wages far in excess of £365 *per annum*. Your council has always affirmed, and your representatives obtained confirmation from the Federal Council, that one of the conditions of negotiations with the Commonwealth Government was that there should be a wage limit. It was stated by the late Mr. Abrahams that some of the best evidence presented before the Royal Commission was presented by Western Australia.

To meet the financial demands of fighting national health insurance, both State and Federal, a general meeting amended the rules by increasing subscriptions by £2 2s. *per annum* for five years, and asked members to pay this subscription in advance. The response to date is £1,829. The total expenses to the end of the year amounted to £2,300, and the probable expenses to date will be another £300.

I am glad that in this State the profession is united. The general practitioners have thoroughly supported the council during this strenuous year, and to date the pledges signed have amounted to 91·6% of the members of the Branch. This shows that the members have confidence in their council and their national health insurance subcommittee.

The extraordinary amount of work and time which Dr. Carter has spent in every phase of this matter, whether detailed reports to the council, the subcommittee, or forceful debate in the Federal Council, has been outstanding in this strenuous time.

Congress, 1940.

A great deal of work towards the 1940 congress has been undertaken, and the matter is now well in hand. My council extends to congress its hearty support. I hope all members will do their utmost to secure a good attendance of their professional friends from the eastern States.

Among the various other matters considered by your council the following important items were dealt with.

Fremantle Hospital Honorary Staff.

Through the efforts of your council satisfactory arrangements have now been made to classify the honorary staff of the Fremantle Hospital.

Re Mental Hospital Administration, Heathcote.

Your council, being disturbed by various reports received, appealed to the Government to hold an inquiry into the administration, without making any accusation. The report of the Royal Commission has thoroughly supported your council's action in this matter, and we trust much benefit to the patients and the profession will result.

Library.

Arrangements have been made to move the library to "Shell House", so that it be a board room also, where meetings can be held for congress and British Medical Association. On behalf of the council I desire to place on record an appreciation of Dr. Donald Smith's generosity in permitting the library to be in "Chennell House" for such a long time on a peppercorn rental, and to take this opportunity of thanking him for his generous action.

British Medical Association Standard Mining Agreement.

After a good deal of work by your subcommittee the British Medical Association standard mining agreement was established in all mining centres, but owing to difficulties at Wiluna the agreement has been broken there.

Alleged Cure for Cancer.

Dr. Ainslie has done a great deal of work in this direction. He first presented to your council various reports of an alleged cure for cancer, and has urged that the Branch should have the matter investigated, either to declare that the new treatment is beneficial or otherwise. At his request your council appointed a subcommittee here who selected special cases, but the results of treatment were bad, and your Branch has now asked that the Federal Council should act in the matter. It was decided by Federal Council to request the Commonwealth Government to take action, and it suggested a *modus operandi*.

Golf.

The annual match between the doctors and the dentists this year proved a victory for the doctors, and the shield is still retained by the Branch.

Post-Graduate Committee.

During the year the Post-Graduate Committee put forward a very excellent post-graduate course, but the attendances at post-graduate meetings have not been at all encouraging for the committee, nor very flattering to the lecturers, and the matter is now under serious consideration as to the holding of such post-graduate meetings. I hope they will be continued, and I feel sure we may successfully increase the attendances. The great difficulty at present is for country doctors to secure locums to enable them to attend post-graduate meetings.

Status of Biochemists and Technical Workers.

This matter has received the serious consideration of your council, and we hope that the conditions of this work at Saint John's Hospital under the new system will prove more satisfactory.

Diphtheria Immunization.

Dr. Thorburn has done excellent work in representing your council at public meetings held at Fremantle, and it is hoped as a result that diphtheria immunization will be greatly increased.

Workers' Compensation Act.

I would like to remind members that there is a special medical committee formed to consider all disputes of medical accounts under the act, and I desire to state that very arduous and gratuitous, and at times unpleasant, work has been done very ably and willingly by Dr. Frank Gill and Dr. M. K. Moss and Dr. Aberdeen, and we hope this committee will continue to act.

Office-Bearers.

Nominations for office-bearers this year were only sufficient to fill all positions, and therefore no ballot was necessary. I declare the following elected:

President: Dr. N. M. Cuthbert.

President-Elect: Dr. L. E. Le Souef.

Ex-President: Dr. L. A. Hayward.

Honorary Treasurer: Dr. Donald Smith.

Honorary Secretary: Dr. H. Stewart.

Four Members of Council: Dr. J. P. Ainslie, Dr. F. W. Carter, Dr. J. A. Love, Dr. M. K. Moss.

I desire to place on record the very valuable services of Dr. Frank Gill as member of the council for many years. Dr. Gill has held the positions of honorary treasurer, president of the Branch and member of the council, and this year indicated that he would not be eligible for office, as he considered that the vacancy should be filled by a general practitioner.

Before vacating the chair I would like to thank the members of council for the support they have given me during my year of office, which has been a particularly strenuous one for all of us. I especially desire to thank Dr. Le Souef for his untiring energies as honorary secretary. I am glad he has been elected president-elect. He has been nine years honorary secretary and has done an enormous amount of work for the Branch.

I have much pleasure in welcoming Dr. Hector Stewart, who is thoroughly capable of taking over the arduous duties of honorary secretary.

I also wish to be placed on record my appreciation, and also the appreciation of members of council, of the work done this year by the secretary, Mr. Hancock, and his office staff. Only those of us who have been in constant touch with the Branch office realize the enormous strain that has been put on him.

I have now great pleasure in vacating the chair and with every confidence ask Dr. N. Cuthbert to take over.

Induction of President.

Dr. Hayward then introduced Dr. N. M. Cuthbert, the president for the ensuing twelve months, and vacated the chair in his favour.

Library Report.

In the absence of Dr. Cyril Bryan, the honorary librarian, the library report was read by Dr. L. A. Hayward. The report, which was adopted, is as follows.

I beg to submit the report of the Branch library for the year ended March 25, 1939.

The library continues to grow in the estimation of members, during the year more than 300 visits having been paid by doctors, while numerous telephone inquiries and requests from country members were received.

With the institution of air mail services to the eastern States and other parts of the world, and with the very valuable acquisition to the library of the "Quarterly Cumulative Index Medicus" and catalogues of the medical libraries in Australia, access can be had in the shortest possible time to all the more important books and journals of the medical world not contained in or subscribed to by the library.

Steps are being taken by the local branch of the Royal Australasian College of Surgeons to include us in the benefits to be derived from the college library, as to the obtaining of photostat copies; and while on this subject may I suggest that any members receiving photostat copies of any articles which they no longer need, should donate them to the library, where they will be filed and indexed.

As hitherto, we have to thank the librarian and the medical secretary of the Victorian Branch of the British Medical Association for their very generous assistance on numerous occasions; various doctors who have been good enough to loan books and journals when asked to do so, and others who have continued to donate their journals regularly to the library, namely, Dr. J. Vere Arkle, Dr.

BRITISH MEDICAL ASSOCIATION (WESTERN AUSTRALIAN BRANCH).

Statement of Receipts and Payments for Year ended December 31, 1938.

RECEIPTS.	£ s. d.	£ s. d.
January 1, 1938—		
Balance at Bank of New South Wales, Perth		143 8 0
Interest—		
Commonwealth Loans	£113 3 4	
Australasian Medical Publishing Company, Limited ..	15 5 0	
		128 8 4
Annual Subscriptions	1,302 3 3	
Special Advance of Subscriptions to meet National Health Insurance Expenses	1,829 1 0	
		3,131 4 3
Refund Federal Council Expenses Advanced		502 14 2
Refund South British Insurance Advance ..		4 5 0
Anatomy School—Account Fees		18 18 0
Dinner Fund—Account Collection		51 10 9
Honorary Medical Staff, Perth Hospital—Donation to Library		20 0 0
Medical Defence Association—Collections ..		2 0 6
Medical Benevolent Fund—Collections		1 1 0
		£4,003 10 0

PAYMENTS.	£ s. d.	£ s. d.
Printing, Stationery and Postages		212 15 8
Assistant Secretary's Salary, including Office Fee and Clerical Assistance (14 months)		175 0 0
Honorarium (to November 30, 1938)—Miss Wishart		26 5 0
Honorary Treasurer's Assistant		10 0 0
Legal Expenses		20 3 6
General Expenses		2 7 6
Library—Rent, Salaries, Books and Telephone		156 1 0
Dinner Fund		68 1 1
Refund—Medical Defence		2 0 6
Refund—Medical Benevolent Fund		1 1 0
Federal Council Contribution—2s. per head ..		27 2 0
London—Account Journals		364 13 5
Sydney—Account Journals		284 0 0
Advance to Federal Council Representatives	£429 15 10	
Insurance—National Health Insurance	10 15 0	
Refund Advance Subscriptions Two Members	21 0 0	
		461 10 10
Transfer to Medical Political Account		1,751 7 0
December 31, 1938—		
Balance at Bank of New South Wales, Perth	£382 15 0	
Cash on Hand	58 6 6	
		441 1 6
		£4,003 10 0

INVESTMENT FUNDS ACCOUNT.

	£ s. d.	£ s. d.
December 31, 1937—		
Invested Funds on Hand	3,255 0 0	
December 31, 1938—		
Invested Funds on Hand, held by Bank of New South Wales, per Certificate dated January 19, 1939—		
Commonwealth Treasury Bonds	£2,910 0 0	
THE MEDICAL JOURNAL OF AUSTRALIA—Debentures	345 0 0	
		3,255 0 0
	£3,255 0 0	£3,255 0 0

We hereby certify that this statement has been audited according to the books and vouchers submitted and found correct.

(Signed) T. C. BOYD, Hon. Auditor.
(Signed) A. W. FARMER, Hon. Auditor.

(Signed) DONALD SMITH, Hon. Treasurer.

March 8, 1939.

BRITISH MEDICAL ASSOCIATION (WESTERN AUSTRALIAN BRANCH).

Medico-Political Account from July 29 to December 31, 1938.

Cr.	£ s. d.	£ s. d.
Response to Special Request for Advance of Subscriptions to meet National Health Insurance Expenses—		
July, 1938, 43 Members paid	£456 5 0	
Aug., 1938, 55 Members paid	561 5 0	
Sept., 1938, 14 Members paid	133 2 0	
Oct., 1938, 51 Members paid	492 1 0	
Nov., 1938, 14 Members paid	129 14 0	
	1,772 7 0	
Less Two Refunds ..	21 0 0	
		1,751 7 0
Balance at Bank of New South Wales as at December 31, 1938 (Debit)		548 9 5
		£2,299 16 5

Dr.	£ s. d.	£ s. d.
Payments A/c National Health Insurance—		
Special Compensation Federal Representatives when leaving Practices		317 2 0
Special Compensation and Expenses Members attending Royal Commission		103 10 0
Insurance Members attending National Health Insurance Meetings (Air and Road)		39 16 0
Mr. Goodes, Economist—		
Fare, Air, and Expenses to Sydney Meeting		60 10 0
Special Fee for Services		157 10 0
Clerical—		
Special Allowance to compensate Secretary		214 0 0
Honorarium to Chief Stenographer		26 5 0
Salary for Second Stenographer		77 2 6
Honorarium to Treasurer's Assistant ..		10 0 0
Overtime, Clerical Assistance		49 7 0
Payment to Mines for Returns		19 7 0
Payment to Lodges for Returns		78 15 0
Telephone, Telegrams and Postages		80 15 1
Printing		34 14 10
General Expenses		8 11 3
To Federal Council National Health Insurance Fund—		
21s. per head for 280 Members	£294 0 0	
42s. per head for 280 Members	588 0 0	
		882 0 0
To Federal Council—2s. per head for 280 Members		27 2 0
To Heathcote Royal Commission—Cost Evidence		38 7 8
Dr. Aberdeen—Fare, Expenses to Meeting Federal Council as Extra Representative		75 0 0
		£2,299 16 5

(Signed) DONALD SMITH, Hon. Treasurer.

G. W. Barker, Dr. J. Gordon Hislop and Dr. M. K. Moss; also Dr. T. C. Boyd and Dr. Bruce A. Hunt for bound volumes of *The Proceedings of the Royal Society of Medicine*; and to the following, who have donated books and journals to the library during the past year: Dr. H. J. A. Barnard, Dr. Noel M. Cuthbert, Dr. A. W. Farmer, Dr. R. D. McKellar-Hall, Dr. Bruce A. Hunt, Dr. Alfred Jacobs, Dr. H. J. Lotz, Dr. P. C. Thomas and Mr. T. L. Stevenson (dental surgeon).

This report is written on the eve of our departure from "Chennell House". The library will in future be housed in the board room of the Association in "Shell House", and its usefulness will, I am certain, be very considerably increased. At the same time I do trust that a certain sum will be set aside for a number of standard works. A medical compendium on the lines of Lewis's "Surgery" is badly needed.

I feel the time has arrived for one copy of *The British Medical Journal* and *The Lancet* to be ordered to be sent to the library by air mail each week, and I am asking the permission of council to order same.

During the year Miss Bryan returned to the library as assistant librarian. Her return was welcomed, as she had gained a unique knowledge of the work and had always given every satisfaction.

I desire to thank the officers of council of the Branch for their assistance in every way, and members generally for their advice and forbearance.

Medical Benevolent Association.

Dr. G. B. G. Maitland submitted the report of the Medical Benevolent Association. The report was adopted and the office-bearers were reelected. It was resolved that a personal letter should be sent to all members appealing for support and that the question of the Medical Benevolent Association should be discussed at the next meeting.

Post-Graduate Committee.

Dr. Ainslie submitted a comprehensive report of the Post-Graduate Committee. The report was received and adopted. Dr. H. S. Lucraft and Dr. A. W. Farmer were reelected members of the committee as physician representative and representative of other Branches respectively.

National Health Insurance.

Dr. F. W. Carter presented a report on the subject of national insurance. He gave an account of the meeting of the Federal Council and outlined the discussions recently held between the Federal Council and the Commonwealth Government.

Vote of Thanks.

A vote of thanks was accorded to Dr. James Bentley for his provision of accommodation for the meeting and for his hospitality.

Post-Graduate Work.

AFTERNOON CLINICAL DEMONSTRATIONS IN MELBOURNE.

THE Melbourne Permanent Post-Graduate Committee announces that a series of afternoon clinical demonstrations has been arranged as follows.

Wednesday, June 21.—Dr. S. V. Sewell, at the Royal Melbourne Hospital.

Wednesday, June 28.—Dr. C. Gordon Shaw, at Saint Vincent's Hospital.

Wednesday, July 5.—Mr. Hugh Trumble, at the Alfred Hospital.

Wednesday, July 12.—Dr. J. W. Grieve, at the Children's Hospital.

Wednesday, July 19.—Dr. A. M. Wilson, at the Women's Hospital.

Wednesday, July 26.—Dr. Mark Gardner, at Eye and Ear Hospital.

The fee for this course will be one guinea, or five shillings may be paid for each demonstration.

ANNUAL REFRESHER COURSE IN MELBOURNE.

THE Melbourne Permanent Post-Graduate Committee announces that the annual refresher course will be held from August 14 to August 26, 1939. The programme is as follows.

Monday August 14.—At the Royal Melbourne Hospital: 9.30 a.m., registration at post-graduate office, Royal Melbourne Hospital; 10 a.m., Dr. Leslie Hurley and Mr. Victor Hurley, a discussion of empyema; 2.30 p.m., Dr. Hume Turnbull, clinical demonstration. At the University: Professor R. D. Wright, "Applied Physiology of the Gastro-Intestinal Tract"; Professor MacCallum and staff, "Pathology of the Gastro-Intestinal Tract".

Tuesday, August 15.—At the Alfred Hospital: 9.30 a.m., Dr. R. A. Willis, pathological demonstration; 10.15 to 11.15 a.m., Dr. M. D. Silberberg, cases illustrating types, grades and stages of *angina pectoris*; 11.45 a.m. to 12.45 p.m., Mr. Balcombe Quick, "A Finger in the Rectum"; 2.30 to 3.30 p.m., Mr. H. C. Colville, "Some Problems in the Treatment of Osteomyelitis"; 4 to 5 p.m., Dr. F. Kingsley Norris, "The Abuse of Weights and Measures in the Care of Children".

Wednesday, August 16.—At Saint Vincent's Hospital: 10 to 11 a.m., Mr. Leo Doyle, "Some Applications of Local Anæsthesia"; 11.30 a.m. to 12.30 p.m., Dr. W. J. Newing, "Problems in the Investigation and Management of Diseases of the Chest"; 2.30 p.m., Dr. F. J. Colahan, clinical demonstration. At the Medical Society Hall: 8.15 p.m., Dr. Ivan Maxwell, "Applied Pharmacology of the Digestive Organs"; Dr. Eric Cooper, "Diet in Gastro-Intestinal Disease".

Thursday, August 17.—At the Royal Melbourne Hospital: 9.30 a.m., Dr. R. J. Wright-Smith, pathological demonstration; 10.30 a.m. to 12.30 p.m., Dr. G. C. Scantlebury and staff of Ear, Nose and Throat Department of the Royal Melbourne Hospital, demonstrations of ear, nose and throat patients and technique of value to the general practitioner. At the Alfred Hospital: 2.30 to 4.30 p.m., Dr. Ringland Anderson and staff of Eye Department, demonstration of ophthalmological patients and methods.

Friday, August 18.—At the Women's Hospital: 10 to 11 a.m., Dr. A. M. Wilson, "The Management, during Pregnancy and Labour, of the Slightly Abnormal Case"; 11.30 a.m. to 12.30 p.m., Dr. A. Sherwin, "Conservative Gynæcology and Physiotherapy in the Treatment of Pelvic Inflammation; 2.30 p.m., Professor R. Marshall Allan and Dr. Vera Krieger, clinical demonstration in wards, including biochemistry. At the Medical Society Hall: 8.15 p.m., Dr. J. R. Bell, "The Medical Treatment of Gastric and Duodenal Ulcers"; Sir Hugh Devine, "The Surgical Treatment of Gastric and Duodenal Ulcers".

Saturday, August 19.—At the Austin Hospital: 10 a.m. to 12 noon, Dr. Bell Ferguson and Dr. Clive Fitts, "Pulmonary Tuberculosis".

Sunday, August 20.—A morning visit will be arranged to the Orthopædic Section of the Children's Hospital at Frankston, where members of the staff will give a series of demonstrations.

Monday, August 21.—At the Royal Melbourne Hospital: 10 to 11 a.m., Dr. R. P. McMeekin, demonstration of clinical rarities; 11.15 a.m., Dr. Julian Smith, junior, the surgical treatment of anal disorders—a practical demonstration; 2.30 to 3.30 p.m., Mr. John Turner, "Infections of the Hand"; 4 to 5 p.m., Dr. K. D. Fairley, "Recent Advances in Therapeutics, with Special Reference to the Sulphanilamides".

Tuesday, August 22.—At the Alfred Hospital: 10 to 11 a.m., Dr. J. F. Chambers, "Deficiency Diseases"; 11.30 a.m. to 12.30 p.m., Mr. Marshall Renou, "Modern Treatment of Syphilis"; 2.30 p.m., Mr. Fay Maclure, clinical demonstration. At the Medical Society Hall: 8.15 p.m., Dr. Ian Wood, "The Treatment of Hæmatemesis"; Dr. Blois Lawton, "Chronic Diarrhœa".

Wednesday, August 23.—At Saint Vincent's Hospital: 9.30 a.m., Dr. S. Bray, pathological demonstration; 10.15 to 11.15 a.m., Mr. H. Mortensen, "Various Aspects of Prostatic Disease"; 11.45 a.m. to 12.45 p.m., Dr. F. Niall, "The Management of Congestive Heart Failure"; 2.30 p.m., Mr. F. Morgan, "Head Injuries"; 4 p.m., Dr. T. E. Lowe, "The Modern Treatment of Diabetes Mellitus".

Thursday, August 24.—At the Children's Hospital: 9.30 a.m., Dr. R. Webster, pathological demonstration; 10.15 to 11.15 a.m., Mr. D. O. Brown, "Treatment of Burns"; 11.45 a.m. to 12.45 p.m., Dr. R. Southby, "Meningismus". At the Infectious Diseases Hospital: 2.30 p.m., Dr. F. Scholes and staff, ward round. At the Medical Society Hall: Dr. S. O. Cowen, "Functional Digestive Disorders"; Mr. Allan Hailes, "The Management of Patients Suffering from Diseases of the Biliary Tract".

Friday, August 25.—At the Royal Melbourne Hospital: 10 to 11 a.m., Dr. H. F. Praagst, "The Value of Radiology in the Elucidation of Causes of Right-Sided Abdominal Pain"; 11.30 a.m. to 12.30 p.m., Dr. F. M. Burnet, "Viruses in Relation to Human Disease"; 2.30 to 3.30 p.m., Dr. E. G. Robertson, clinico-pathological demonstration of neoplasms in the posterior cranial fossa; 4 p.m., Dr. H. F. Maudsley, "Modern Methods of Psychiatric Treatment".

Saturday Morning, August 26.—At Saint Vincent's Hospital: Demonstration of the technique of minor procedures of value to the general practitioner: venesection, withdrawal of blood for diagnostic procedures, estimation of hæmoglobin, blood transfusion, the giving of intravenous saline solution injections, tapping of the chest, tapping of the abdomen, catheterization, gastroscopy *et cetera*.

The fee for the refresher course will be three guineas. The fee for the series of evening lectures will be one guinea to those taking the refresher course.

A COURSE IN GASTRO-INTESTINAL DISEASES AT MELBOURNE.

THE Melbourne Permanent Post-Graduate Committee announces that a course of lectures in gastro-intestinal diseases will be delivered in Melbourne, commencing at 8.15 o'clock p.m., as follows.

Monday, August 14.—At the University of Melbourne: Professor R. D. Wright, "Applied Physiology of the Gastro-Intestinal Tract"; Professor MacCallum and staff, "Pathology of the Gastro-Intestinal Tract".

Wednesday, August 16.—At the Medical Society Hall, Albert Street: Dr. Ivan Maxwell, "Applied Pharmacology of the Digestive Organs"; Dr. Eric Cooper, "Diet in Gastro-Intestinal Diseases".

Friday, August 18.—At the Medical Society Hall: Dr. J. R. Bell, "The Medical Treatment of Gastric and Duodenal Ulcers"; Sir Hugh Devine, "The Surgical Treatment of Gastric and Duodenal Ulcers".

Tuesday, August 22.—At the Medical Society Hall: Dr. Ian Wood, "The Treatment of Hæmatemesis"; Dr. Blois Lawton, "Chronic Diarrhœa".

Thursday, August 24.—At the Medical Society Hall: Dr. S. O. Cowen, "Functional Digestive Disorders"; Mr. Allan Hailes, "The Management of Patients Suffering from Diseases of the Biliary Tract".

The fee for this course will be two guineas (one guinea if taken in conjunction with the refresher course).

A COURSE IN GYNÆCOLOGY AND OBSTETRICS IN MELBOURNE.

THE Melbourne Permanent Post-Graduate Committee announces that a course in obstetrics and gynæcology will be conducted at the Women's Hospital, Melbourne, from August 28 to September 2, 1939. The programme is as follows.

Monday, August 28.—9 a.m., Professor Marshall Allan will be present to meet post-graduates and offer suggestions; gynæcology, operations, Dr. R. N. Wawn; 10.30 a.m., obstetrics, antenatal clinic, Professor Marshall Allan; 11.30 a.m., clinical lecture, "Glandular Therapy in Obstetrics and Gynæcology", Dr. J. S. Green; 2.30 p.m., gynæcology, out-patients, Dr. A. M. Hill; 4.15 p.m., clinical lecture, "The Investigation and Diagnosis of Puerperal Sepsis", Dr. A. M. Hill.

Tuesday, August 29.—9 a.m., gynæcology, operations, Dr. A. Sherwin; 10.30 a.m., obstetrics, antenatal clinic, Dr. W. Ivon Hayes; 11.30 a.m., clinical lecture, "The Care of the New-Born Infant", Dr. Kate Campbell; 2.30 p.m., gynæcology, out-patients, and a demonstration on contraceptives, Dr. G. Simpson; 4.15 p.m., gynæcology, radium clinic, Dr. W. G. Cuscaden.

Wednesday, August 30.—9 a.m., gynæcology, operations, Dr. W. G. Cuscaden; 10.30 a.m., obstetrics, antenatal clinic, Dr. W. D. Saltau; 11.30 a.m., clinical lecture, "The Treatment of Puerperal Sepsis", Dr. E. R. White; 2.30 p.m., gynæcology, out-patients, Dr. A. M. Wilson; 4.15 p.m., clinical lecture, Professor Marshall Allan.

Thursday, August 31.—9 a.m., gynæcology, operations, Dr. A. Sherwin; 10.30 a.m., obstetrics, antenatal clinic, Dr. Elliott True; 11.30 a.m., clinical lecture, "The Indications for Cæsarean Section", Dr. W. Ivon Hayes; 2 p.m., gynæcology, operations, Dr. Percy Brett; 2.30 p.m., gynæcology, out-patients, Dr. J. S. Green; 4.15 p.m., practical demonstration, intravenous medication and blood-typing, Dr. R. M. Rome.

Friday, September 1.—9 a.m., gynæcology, operations, Dr. N. Lennox Spiers; 10.30 a.m., obstetrics, antenatal clinic, Dr. A. Harley; 11.30 a.m., clinical lecture, "X Rays in Obstetrics and Gynæcology", Dr. Colin Macdonald; 2.30 p.m., gynæcology, out-patients, Dr. R. Worcester; 4.15 p.m., clinical lecture, "Sterility", Dr. R. Worcester.

Saturday, September 2.—9 a.m., gynæcology, out-patients, Dr. Leon Jona; 10.30 a.m., question hour, Professor Marshall Allan for obstetrics, Dr. E. R. White for gynæcology.

During the week the ordinary routine work at the Women's Hospital will be maintained and those attending the course will have the opportunity of seeing the routine and emergency obstetric operations. Also arrangements will be made, if desired, to allow visiting graduates to assist at gynæcological operations.

Accommodation at the Women's Hospital will be available for a limited number of graduates, and early application is suggested. An additional fee of three guineas per week, payable to the Women's Hospital, is charged for this facility.

The fee for the course will be two guineas.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 24, of April 20, 1939.

AUSTRALIAN MILITARY FORCES AND SENIOR CADETS.

First Military District.

Australian Army Medical Corps.

The provisional appointment of Captain R. A. Maxwell is terminated, 26th March 1939.

To be Captain (provisionally) supernumerary to establishment pending absorption.—Roy Allan Maxwell, 27th March, 1939.

Second Military District.

Australian Army Medical Corps.

The provisional appointment of Captain D. A. S. Fraser is confirmed. Captain C. J. Gibson is seconded for a period of two years from 11th February, 1939. Captain (provisionally) D. S. Atkins is transferred to the Reserve of Officers (A.A.M.C.) and to be Honorary Captain, 1st March, 1939.

Unattached List.

Major A. J. Mollison is transferred to the Reserve of Officers (A.A.M.C.), 1st April, 1939.

Third Military District.

Australian Army Medical Corps.

To be Captain (provisionally) supernumerary to establishment pending absorption—Max Alfred Rees, 10th March, 1939. Captain (provisionally) P. Lewis is transferred to the Reserve of Officers (A.A.M.C.) and to be Honorary Captain, 22nd February, 1939.

Australian Army Medical Corps Reserve.

To be Honorary Captains—Lieutenant D. O. Shiels, 6th October, 1938; Charles Stewart Donald and Edwin Watchorn Turner, 10th March, 1939.

Fourth Military District.

Australian Army Medical Corps.

Lieutenant-Colonel D. L. Barlow, M.C., E.D., relinquishes the command of the 6th Cavalry Field Ambulance and is transferred to the Unattached List, 2nd March, 1939. Major E. F. West is transferred to the Reserve of Officers (A.A.M.C.), 16th March, 1939.

Australian Army Medical Corps Reserve.

To be Captain—William John Patterson, 15th February, 1939. *To be Honorary Captains*—Melville Ernest Chinner, Kenneth Willoughby Bollen, Walter Alfred Russell, Henry Edwin Pellew and Hillary Ray Penn Boucaut, 8th March, 1939; and Ian Aylíffe Hamilton, 17th March, 1939.

Captain R. P. Wheeler is retired.

Fifth Military District.

Australian Army Medical Corps.

Honorary Captain S. Finkelstein is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally) supernumerary to establishment pending

absorption, 28th February, 1939. The provisional appointments of Captains W. Muir and J. D. Palandri are confirmed.

Australian Army Medical Corps Reserve.

To be Honorary Captain—Noel Swifte Williams, 16th March, 1939.

Sixth Military District.

Australian Army Medical Corps.

To be Captain (provisionally) supernumerary to establishment pending absorption—Campbell Amiet Duncan, 6th March, 1939. The provisional appointment of Captain T. D. Freeman is confirmed.

ROYAL AUSTRALIAN AIR FORCE: PERMANENT FORCE.

Medical Branch.

To Wing Commander—Squadron Leader (Acting Wing Commander) E. A. Daley, 1st July, 1938.—Ex. Min. No. 118.

Special Correspondence.

LONDON LETTER.

BY OUR SPECIAL CORRESPONDENT.

THE English criminal law courts have recently furnished an interesting instance of the legal irresponsibility of non-medical witnesses who venture to testify on oath to the state of mind of a person charged with murder. In such cases even the medical expert is often in an unenviable position, for the law apparently expects him to swear to the mental state of responsibility, not at the time of the examination, but at some antecedent date when the crime was committed. When a young non-medically trained scientist with no knowledge of the structure, functions or diseases of the brain, and no experience of mental disorders, leaps into the breach and witness-box with a front page splash light of publicity, it is hardly surprising that the wrath of the judge is aroused, or that his vitriolic comments on the procedure have aroused some interest and concern in medical circles. The circumstances were briefly as follows.

A middle-aged man, a severe and admitted epileptic, was charged with the murder of a child—a crime which clearly had neither purpose nor motive. He had been discharged from the army for epilepsy, and skilled and expert medical witnesses testified to his irresponsibility. The defence proved its case up to the hilt, but unfortunately it went further and sought to "gild refined gold and to paint the lily". It called upon a young physiologist, who had studied the Berger rhythm and electroencephalography, to describe to the learned judge the uses of this experimental method of diagnosing epilepsy. The learned judge would have none of it, and to make matters worse the witness in question had, during the progress of the trial, and before being called upon for his evidence, given an interview to the Press descriptive of his machine for the electrical diagnosis of epilepsy. The editor of the worst of the Press offenders against the dignity of the court saved himself from being committed for contempt by promptly appearing before the judge and offering his humble apologies. Of the witness himself the judge said that had it not been for the fact that a trial for murder was actually taking place, he would have looked upon it as a cheap puff for the witness. "The article in question had attributed to him matters, such as the invention of the machine, which upon oath he had to admit were untrue."

In questions of sanity and responsibility medicine and the law speak two different languages, for in matters of the mind the law is still a century behind. It can therefore cause no surprise that the judge swept on one side the possibilities of the Berger rhythm and the electroencephalograph. Doubtless the latter has its place, or may find it when all proper controls have been carried out; but that place is not as yet the witness-box or a trial for murder. Epilepsy is a symptom, not a disease, and as such is readily diagnosed by any properly qualified medical man without the mechanical aid of what the judge called a "contraption". The case did nothing to ease the difficulties of the expert mental witness in cases of criminal responsibility.

Of less medical but more general interest is the question, now under parliamentary discussion, of the uselessness of flogging as a possible deterrent to crime. It is only a few months ago since this question came prominently under the notice of the public. Four young men, of good family and with Mayfair addresses, conspired together to induce a Bond Street jeweller to visit them at a well-known and fashionable Mayfair Hotel and to bring with him a parcel of jewels. He was brutally assaulted, robbed and left for dead, and the Chief Justice prescribed, for the two worst offenders, a stiff sentence and a round dozen of the cat-o'-nine-tails. Here indeed did the law make no difference between poor and rich. The bill before Parliament seeks to abolish this power to inflict corporal punishment. In the Standing Committee of the House of Commons, which is considering the clause in the Criminal Justice Bill which embodies the proposal to abolish flogging for all offences except assaults on prison warders, the clause was carried by 32 votes to 17, the interesting feature being that the minority comprised most of the women members of the committee, who doubtless felt that flogging is the only suitable treatment for some of the worst of the offenders against their sex and persons.

Those Australians who may be visiting London this year will be interested, and possibly even surprised, to find many of our most beautiful parks—Hyde Park, St. James's, Green Park, to mention only a few—converted in part to the grim purposes of war. Air raid protection trenches disfigure the landscape in all directions. Hastily prepared as these were during the September crisis, they have not even yet been permanently finished, and mounds of earth, timber, and galvanized iron take the place of daffodils, lilies and tulips.

It is also more than probable that Australian visitors, especially those to the provinces, who are the recipients of private hospitality, will find their host and hostess quite complete with gas masks, served out by the million, pumps and shovels for incendiary bombs, and a shell-proof shelter in the garden. These are signs of the times, and certainly never before in our long island history have so many private citizens made quite such adequate preparations for the now most dreaded of wars—that from the air.

Correspondence.

FACTA, NON VERBA.

SIR: I think the following is worthy of promulgation freely as an example of *facta, non verba*.

Three weeks ago, twelve hours after confinement, a patient of mine had the most severe *post partum* hæmorrhage of my twenty years' experience. This was at 11.15 a.m. At 11.30 a.m. I contacted with the medical superintendent of Crown Street Hospital for Women, who at once, and without question, set the machinery for blood transfusion in motion.

Three-quarters of an hour later a medical officer, a nurse, with full transfusion equipment, and a blood donor arrived at the house, seven miles distant from the hospital. The blood of the patient was typed and checked with that of the donor, and by 1.15 p.m. 600 cubic centimetres of blood were being transfused. This was accomplished without demanding of us even as much as a safety pin.

Three hours later the patient was well enough to be removed to hospital, where the recovery has been uninterrupted and complete. Definitely a life saver!

Personally I am indebted to the hospital for this service and would recommend it to my fellow practitioners.

Yours, etc.,

"SYDNEY SUBURBAN PRACTITIONER."

Undated.

WHOLE SUPRARENAL GLAND IN THE TREATMENT OF ALLERGIC CONDITIONS.

SIR: Your extract of Dr. Orville E. Barbour's contribution in the *Archives of Pediatrics* on the treatment of allergic conditions by whole suprarenal gland is interesting.

Some years ago I was treating patients with muscular dystrophy by fresh whole suprarenal glands eaten raw daily.

Two of these patients showed improvement, but the treatment had to be discontinued because each of them developed allergic reactions to the eating of the gland, and only after several weeks' treatment by it.

Yours, etc.,

PAUL G. DANE.

110, Collins Street,
Melbourne, C.1,
May 8, 1939.

Proceedings of the Australian Medical Boards.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Kenny, James William, M.B., B.S., 1931 (Univ. Melbourne), Launceston.

Lloyd-Green, Lorna, M.B., B.S., 1933 (Univ. Melbourne), Beaconsfield.

Obituary.

ALBERT OTTO DEGENHARDT.

WE regret to announce the death of Dr. Albert Otto Degenhardt, which occurred on May 11, 1939, at Melbourne, Victoria.

FREDERICK SAMUEL TAYLOR THOMAS.

WE regret to announce the death of Dr. Frederick Samuel Taylor Thomas, which occurred on May 13, 1939, at Sydney, New South Wales.

Notice.

LECTURES ON GAS WARFARE IN SYDNEY.

THE Medical Women's Society of New South Wales announces that a special course of four lectures on gas warfare will be delivered at Saint John's Ambulance Assembly Hall, 44, Margaret Street, Sydney, on May 20, 1939, and the three succeeding Saturdays, from 2.30 to 5.30 o'clock p.m. The lectures will be delivered by Dr. Ardill-Brice, and they have been arranged so that members of the society may be able to qualify to become instructors. Members are invited to notify the honorary secretary, Dr. Doris A. Selby, Box 175 D, G.P.O., Sydney, of their intention of attending the course. The fee for the course will be three shillings and sixpence.

Books Received.

"ESSENTIALISM"—THE NEW CONCEPTION OF CHRISTIANITY AND OF WORLD RELIGIONS; 1938. London: Sanders, Phillips and Company Limited. Demy 8vo, pp. 479. Price: 5s. net.

THE SECRET OF LIFE. COSMIC RAYS AND RADIATIONS OF LIVING BEINGS, by G. Lakhovsky, translated from the French by M. Clement; 1939. London: William Heinemann (Medical Books) Limited. Demy 8vo, pp. 209, with illustrations. Price: 10s. 6d. net.

ASTHMA, by F. Coke, F.R.C.S., with the collaboration of H. Coke, M.R.C.S., L.R.C.P.; Second Edition, fully revised and illustrated; 1939. Bristol: John Wright and Sons Limited. Demy 8vo, pp. 278. Price: 15s. net.

THE DIABETIC ABC: A PRACTICAL BOOK FOR PATIENTS AND NURSES, by R. D. Lawrence, M.A., M.D., F.R.C.P.; Sixth Edition; 1939. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 71. Price: 3s. 6d. net.

HOW TO CURE EYE DISEASES WITHOUT OPERATION, WITH SPECIAL REFERENCE TO GLAUCOMA, CATARACT AND DETACHMENT OF THE RETINA: A SUMMARY OF 25 YEARS OF SUCCESSFUL NON-OPERATIVE MEDICAL PRACTICE, by W. Luftig, M.D.; 1939. London: The C. W. Daniel Company Limited; Australia: Angus and Robertson. Demy 8vo, pp. 387, with illustrations. Price: 16s. net.

BABIES ARE HUMAN BEINGS: AN INTERPRETATION OF GROWTH, by C. A. Aldrich, M.D., and M. M. Aldrich; 1938. New York: The MacMillan Company; Australia: Angus and Robertson. Demy 8vo, pp. 140, with illustrations. Price: 7s. 6d. net.

TROPICAL MEDICINE, by L. Rogers, K.C.S.I., C.I.E., LL.D., M.D., B.S., F.R.C.P., F.R.C.S., F.R.S., and J. W. D. McGaw, K.C.I.E., B.A., M.B., Hon. D.Sc.; Third Edition; 1939. London: J. and A. Churchill Limited. Super royal 8vo, pp. 553, with illustrations. Price: 16s. net.

RECENT ADVANCES IN MEDICINE: CLINICAL, LABORATORY, THERAPEUTIC, by G. E. Beaumont, M.A., D.M., F.R.C.P., D.P.H., and E. C. Dodds, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P.; Ninth Edition; 1939. London: J. and A. Churchill Limited. Large crown 8vo, pp. 447, with 42 illustrations. Price: 15s. net.

THE PHYSIOLOGICAL BASIS OF THE ART OF SINGING, by H. Hemery, L.R.A.M.; 1939. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 158, with 59 illustrations. Price: 10s. 6d. net.

GENETICS AND THE CLINICIAN, by L. Ride, M.A., B.Ch., M.R.C.S., L.R.C.P.; 1938. Bristol: John Wright and Sons Limited. Super royal 8vo, pp. 159, with illustrations.

SANITARY LAW IN QUESTION AND ANSWER FOR THE USE OF STUDENTS OF PUBLIC HEALTH, by C. Porter, M.D., B.Sc., M.R.C.P., and J. Fenton, C.B.E., M.D., M.R.C.P., D.P.H.; Fourth Edition; 1939. London: H. K. Lewis and Company Limited. Crown 8vo, pp. 368. Price: 10s. net.

RHEUMATISM, by H. W. Crowe, D.M., B.Ch., M.R.C.S., L.R.C.P.; 1939. London: John Bale Medical Publications Limited. Demy 8vo, pp. 294, with illustrations.

WORTH'S SQUINT OR THE BINOCULAR REFLEXES AND THE TREATMENT OF STRABISMUS, by F. B. Chavasse, M.A., D.M.; Seventh Edition; 1939. London: Baillière, Tindall and Cox. Demy 8vo, pp 712, with illustrations. Price: 25s. net.

A TREATISE ON THE SURGICAL TECHNIQUE OF OTO-RHINOLARYNGOLOGY, by G. Portmann, with the collaboration of H. Retrouvey, J. Despons, P. Leduc and G. Martinaud; translated by P. Viole, M.D.; 1939. London: Baillière, Tindall and Cox. Imperial 8vo, pp. 685, with illustrations. Price: 57s. net.

MEDICAL RESEARCH COUNCIL OF THE PRIVY COUNCIL SPECIAL REPORT SERIES. No. 233: APPENDICITIS: A STATISTICAL STUDY, by M. Young and W. T. Russell; 1939. London: His Majesty's Stationery Office. Medium 8vo, pp. 79. Price: 1s. net.

VIEWLESS WINDS, BEING THE RECOLLECTIONS AND DIGRESSIONS OF AN AUSTRALIAN SURGEON, by H. M. Moran; 1939. London: Peter Davies; Australia: Angus and Robertson Limited. Demy 8vo, pp. 352. Price: 12s. net.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Windsor, Harry Matthew John, M.B., 1939 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Radford, John Goulburn, M.B., B.S., 1939 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Seldon, William Anthony, M.B., B.S., 1939 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Sharp, Alan Cathcart Ritchie, M.B., B.S., 1938 (Univ. Sydney), Sydney Hospital, Sydney.

Stewart, Neville Murray, M.B., B.S., 1938 (Univ. Sydney), Sydney Hospital, Sydney.

Woolnough, James, M.B., B.S., 1938 (Univ. Sydney), District Hospital, Wallsend.

Finkle, Edmund Wesley, L.R.C.P. (Edinburgh), L.R.C.S. (Edinburgh), L.R.F.P.S. (Glasgow), 1937, Gizo, British Solomon Islands.

MacMahon, Christine Helen Mary, M.B., B.S., 1930 (Univ. Sydney), Broughton Hall Psychiatric Clinic, Leichhardt.

Nelson, Edna Lillian, M.B., Ch.M., 1920 (Univ. Sydney), 141, Macquarie Street, Sydney.

Diary for the Month.

MAY 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 24.—Victorian Branch, B.M.A.: Council.
MAY 25.—South Australian Branch, B.M.A.: Branch: Listerian Oration.
MAY 25.—New South Wales Branch, B.M.A.: Branch.
MAY 26.—Queensland Branch, B.M.A.: Council.
JUNE 1.—South Australian Branch, B.M.A.: Council.
JUNE 2.—Queensland Branch, B.M.A.: Branch: Joseph Bancroft Memorial Lecture.
JUNE 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 7.—Victorian Branch, B.M.A.: Branch.
JUNE 7.—Western Australian Branch, B.M.A.: Council.
JUNE 9.—Queensland Branch, B.M.A.: Council.
JUNE 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 20.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 21.—Western Australian Branch, B.M.A.: Branch.
JUNE 22.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 26.—Queensland Branch, B.M.A.: Council.
JUNE 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xviii to xx.

DEPARTMENT OF MENTAL HYGIENE, MELBOURNE, VICTORIA: Medical Officer.

DEPARTMENT OF PUBLIC INSTRUCTION, MELBOURNE, VICTORIA: Medical Officer.

INNISFAIL HOSPITALS BOARD, INNISFAIL, QUEENSLAND: Assistant Medical Officer.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Junior Resident Medical Officer.

ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Senior Resident Medical Officer.

TOOWOOMBA HOSPITALS BOARD, TOOWOOMBA, QUEENSLAND: Resident Medical Officer.

ZEEHAN DISTRICT HOSPITAL AND MEDICAL UNION, ZEEHAN, TASMANIA: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.